

# Western Federal Lands Highway Division Project Development Process Flow Chart



November 2005



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## *FOREWORD*

The Project Development Process Flow Chart is a simplified, web-based framework that outlines the project development process at Western Federal Lands Highway Division. The chart provides comprehensive links to detailed activity definitions and other related forms, guidelines, and policies. The chart is intended to be used as a guideline that can be modified to fit individual project requirements.

Every attempt has been made to provide a complete Project Development Process Flow Chart. However, despite our best efforts, the web-based framework may contain missing links or errors. If you notice a missing link or error, please contact any member of the team (Adam Ahola, Kristin Austin, Karl Gleason, Glenn Kutzera, Kathy Sargeant, or Terri Thomas).

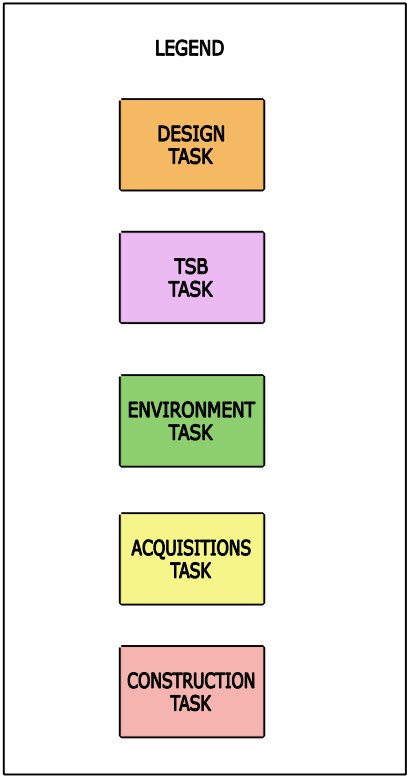
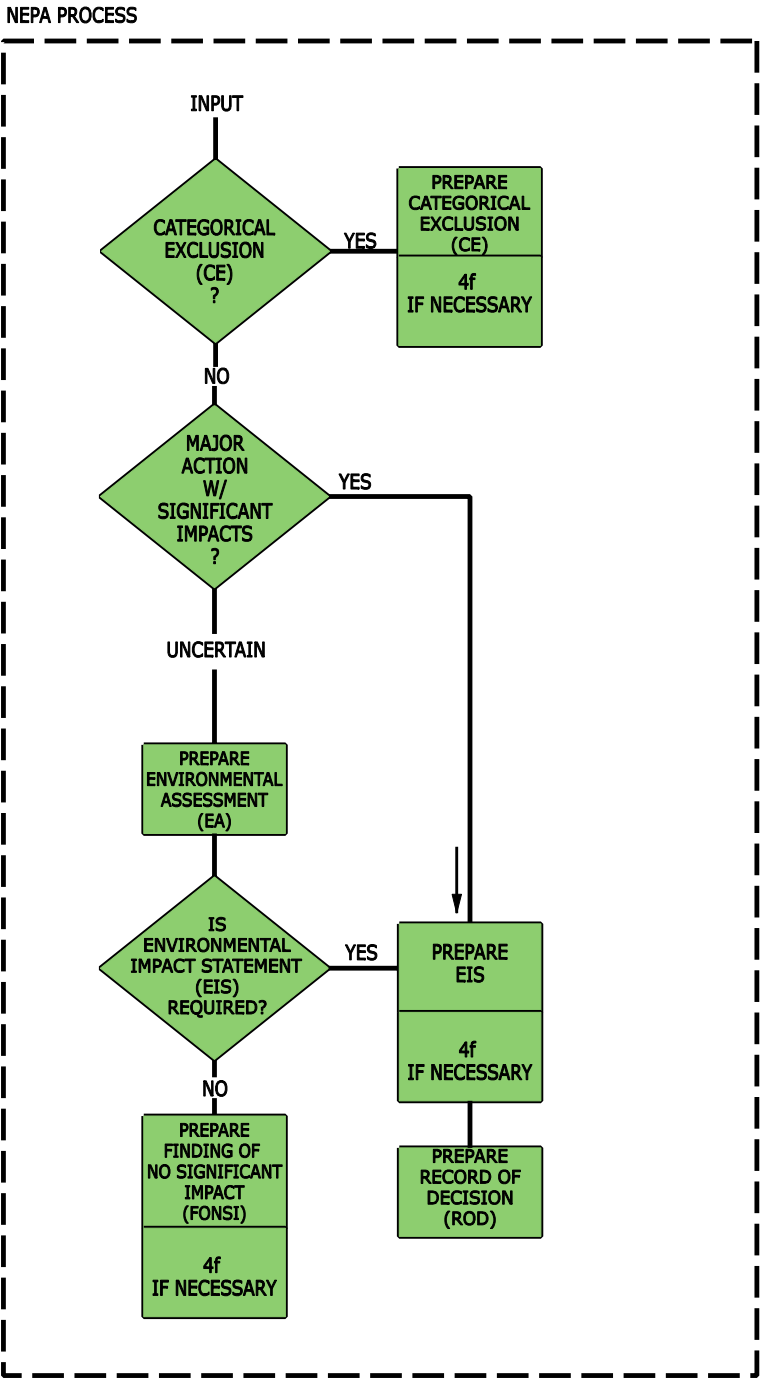
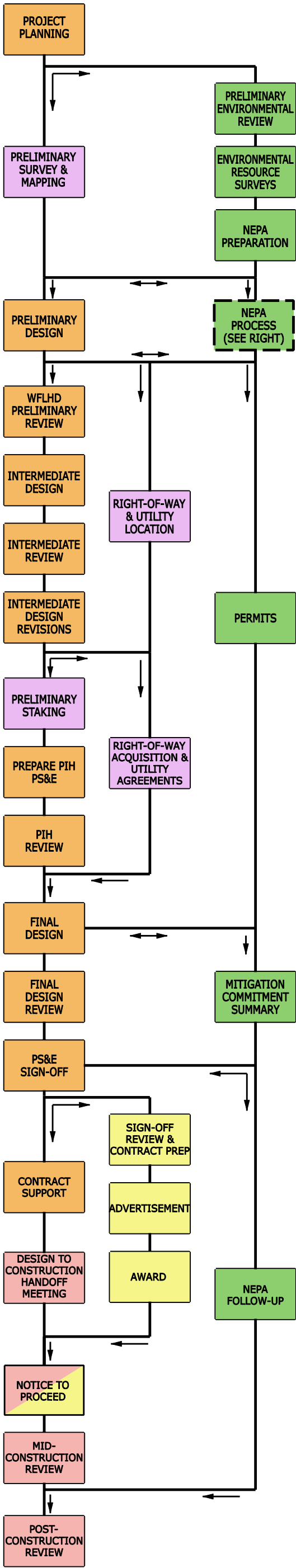
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## Acronyms

ADT	Average Daily Traffic
A/E	Architectural & Engineering
BA	Biological Assessment
BO	Biological Opinion
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFT	Cross-Functional Team
CFR	Code of Federal Regulations
CO	Contracting Officer
COE	Construction Operations Engineer
COTR	Contracting Officer's Technical Representative
CPM	Critical Path Method
CQAS	Construction Quality Assurance Specialist
DAB	Development Advisory Board
DEIS	Draft Environmental Impact Statement
DERT	Division Environmental Review Team
DSC	Denver Service Center
DTL	Design Team Leader
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAR	Federal Acquisition Regulation
FEIS	Final Environmental Impact Statement
FHP	Forest Highway Program
FONSI	Finding of No Significant Impact
FHWA	Federal Highway Administration
HDM	Highway Design Manager
NEPA	National Environmental Policy Act
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOH	Notice of Hearing
NOI	Notice of Intent
NPS	National Park Service
PA	Project Agreement
PDDM	Project Development and Design Manual
PE	Project Engineer
PIH	Plan-in-Hand
PIP	Public Involvement Plan
PIR	Project Identification Report
PM	Project Manager
PRMS	Program Resource Management System

PRP	Parks Road Program
PS&E	Plan, Specification, and Estimate
PST	Pavement Selection Team
QA	Quality Assurance
QC	Quality Control
ROD	Record of Decision
ROW	Right-of-Way
SCRs	Special Contract Requirements
SEE	Social, Economic, and Environmental
SHPO	State Historic Preservation Officer
SOW	Statement of Work
SWPPP	Storm Water Pollution Prevention Plan
THPO	Tribal Historic Preservation Officer
TSB	Technical Service Branch
TSL	Type, Size, and Location
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VA	Value Analysis
VE	Value Engineering
WFLPII	Western Federal Lands Project Improvement Initiative



PROJECT DEVELOPMENT PROCESS FLOW CHART  
WFLHD  
NOVEMBER 2005

## **Activity Definition Project Planning**

### **Receivables/Inputs:**

Not Applicable

### **Activity Description:**

The purpose of this task is to adequately scope the project to provide all necessary information to begin the National Environmental Policy Act (NEPA) process and Preliminary Design. This primarily involves conducting a field review and drafting the appropriate scoping document.

Conduct an initial field review to determine the project scope. Typical attendees include the Project Manager (PM), Lead Designer, Partnering Agency, Program Coordinator, Environmental Specialist, and Geotechnical/Materials Engineer. Other Technical Service Branch (TSB) representatives may attend as requested. As a minimum, the following should be addressed at this meeting:

- Project purpose and need
- Roles and responsibilities of partnering agencies
- List of reasonable project alternatives established using general design guidelines (road width, surfacing, corridor location, etc.)
- Primary contacts for project
- Preliminary project delivery schedule with milestones
- Any special issues or concerns that may impact project alternatives (winter closures, events, etc.)
- Collection and analysis of traffic data (accident history, average daily traffic (ADT) volumes, etc.)
- Preliminary construction estimate
- Environmental concerns for the project (cultural and natural resource) and estimation of the affected environment
- Proposed level of NEPA analysis

Document the above information in a Project Agreement (PA) for National Park Service (NPS) projects or Project Identification Report (PIR) for Forest Highway projects.

The PM will meet with other WFLHD functional leaders to determine the members of the Cross-Functional Team (CFT) for the remainder of the project. The CFT will then meet to determine the method(s) of project delivery (A/E firm or in-house) and establish a project budget and schedule for delivery.

Project accounts are set up for Project Delivery functions.



**Deliverables/Outputs:**

1. Completed scoping document (PA or PIR) including the following:
  - a. Project Purpose and Need identified
  - b. Project roles and responsibilities defined for partnering agencies
  - c. General list of reasonable alternatives established
  - d. Preliminary Project delivery schedule established
  - e. Anticipated environmental impacts for the proposed project identified
2. Project Delivery schedule (PRMS)
3. Project account and budget established in PRMS
4. Preliminary construction estimate
5. CFT selection

**Completion of Activity:**

The CFT is selected, the Project Delivery schedule is entered into PRMS, and the project account and budget are established in PRMS.

**Additional Supporting Documentation:**

[Example Project Agreement](#)

[Example Project Identification Report](#)

[PDDM Chapter 3 ENVIRONMENT](#)

[PDDM Section 4.3 INFORMATION GATHERING](#)

[PDDM Section 4.4 LOCATION ANALYSIS](#)

[Acronym List](#)

**Applicable PRMS Codes:**

D00001

L00001

P00001

P00002

P0PIRI

## **Activity Definition**

### **Preliminary Design**

#### **Receivables/Inputs:**

1. Completed scoping document (PA or PIR)
2. Complete Environmental and Project Delivery schedule (PRMS)
3. Project accounts in PRMS
4. Preliminary Engineering Budget
5. Preliminary construction estimate
6. List of CFT members
7. WFL preliminary survey and mapping
8. Resource surveys (wetlands, archeological sites, and biological assessments)

#### **Activity Description:**

The purpose of this task is to provide adequate design support to effectively analyze the alternatives presented in the Environmental Document. This may include developing multiple line and grades, pavement structures and templates for evaluation. Development of these alternatives should not exceed 30%.

#### ***Designer Guidance:***

Develop design criteria according to the scoping document. Utilize preliminary mapping to strike initial alignments and develop proposed typical sections for each alternative. Hold a Pavement Selection Team (PST) meeting to determine proposed pavement structure options. Obtain preliminary TSB recommendations, as necessary (slopes, bridge foundations, etc.). Incorporate mapping and delineations from resource surveys to determine approximate impacts for each alternative.

Provide further design information to the drafters of the Environmental Document(s) as required. This may include, but is not limited to; total areas of impact, preliminary earthwork quantities, waste & staging areas, material source plans, preliminary drainage designs, bridge TSL, ROW plans, construction phasing and closure schedules, and revised cost estimates.

For Park Roads projects, a Value Analysis (VA) may be performed by the NPS. Provide the appropriate preliminary design information as described above to the Park Service and attend the VA meeting as requested. Following the VA, a Development Advisory Board (DAB) Review will be performed by the NPS. Provide further technical support (preliminary design details, cost estimates, etc.) for this review as requested.

**Deliverables/Outputs:**

1. 30% preliminary plans of the design alternatives (plan/profile sheets, typical sections, major work items identified and located)
2. Preliminary construction cost estimates for alternatives presented in the Environmental Document.

**Completion of Activity:**

NEPA selection of preferred alternative (The FONSI or ROD is completed by environment.)

**Additional Supporting Documentation:**

NPS VA procedures

**PDDM Section 4.4** LOCATION ANALYSIS

**PDDM Section 9.3** INFORMATION GATHERING

**PDDM Section 9.4** PS&E DEVELOPMENT

Acronym List

**Applicable PRMS Codes:**

L00004

L00005

## **Activity Definition**

### **WFLHD Preliminary Review**

#### **Receivables/Inputs:**

1. NEPA-selected preferred alternative (FONSI or ROD completed)
2. Preliminary plans (plan/profile sheets, typical sections, major work items identified and located) for the preferred alternative
3. Preliminary construction cost estimate for the preferred alternative

#### **Activity Description:**

The purpose of this task is to perform internal and external reviews at 30% design of the NEPA-selected preferred alternative.

#### **Designer Guidance:**

Some revisions to the preliminary plan set may be necessary to bring the preferred alternative plan set to a full 30% level of completion. Allow 1-2 weeks for each review, depending on project complexity. The scheduled reviews are as follows:

1. **Design Team Leader/Highway Design Manager (DTL/HDM)**  
**Review.** Provide the preliminary plans to the DTL/HDM for a Quality Assurance/Quality Control (QA/QC) Review. The DTL/HDM will perform a line and grade review using the [Quality Assurance/Quality Control Checklist](#) as a guide.
2. **Field Review.**  
*Note: The field review may take place earlier in the design process to aid in the selection and analysis of alternatives presented in the Environmental Document.*

Document resolutions to DTL/HDM Review comments. Perform revisions and provide copies of the revised plans to the external agencies prior to the scheduled field review. For Forest Highway projects, the field review will typically include all SEE (Social, Economic, and Environmental) Team members. For Park Roads projects, the attendees will typically consist of CFT members, Park representatives and Denver Service Center (DSC) representatives, as requested. If ROW/Utility issues are present, a ROW specialist should be invited to attend. Prepare any presentation materials/visualizations as necessary to appropriately convey design information to the meeting attendees. Accompany the PM/HDM to the external field review and provide technical input as needed.

**Deliverables/Outputs:**

1. Summary of comments provided at the field review.
2. [Trip report](#) discussing accomplishments/decisions made at the preliminary field review

**Completion of Activity:**

The intermediate field review trip is completed.

**Additional Supporting Documentation:**

**PDDM WFL Supplement 9.7:** Section 9.4 PS&E Development -  
Subsection H. Reviews

[Acronym List](#)

**Applicable PRMS Codes:**

D00002  
D0PREV  
D00L&G

## **Activity Definition**

### **Intermediate Design**

#### **Receivables/Inputs:**

Summary of comments provided at the preliminary field review.

#### **Activity Description:**

The purpose of this task is to complete the Plan, Specification, and Estimate (PS&E) package to 50%. The intermediate set of plans should include cross-sections, major pay items with their associated quantities, and major design details such as intersections, turnouts, large culverts, guardrail, walls, and any items affecting environmental permits and ROW acquisition (e.g., the erosion control plan).

#### **Designer Guidance:**

Document resolutions to preliminary field review comments and revise the plan set accordingly.

Complete the design exception portion of the [Highway Design Standards Form](#)

Incorporate CFT recommendations into the plans (Hydraulic, Geotech, etc.). Develop design drawings and quantities required for environmental permits. As needed, provide design information to the ROW Specialist for the development of the draft ROW plans and easement plats.

For projects exceeding \$1 Million in construction costs, a Value Engineering (VE) study is required. This study may be performed in-house or contracted to a consultant. Incorporate any approved VE recommendations into the plan set. If a VA has been performed (NPS projects), this may satisfy the requirements of a VE study. Consult with the PM and HDM for the appropriate action.

Refine the preliminary cost estimate to reflect all intermediate design changes.

#### **Deliverables/Outputs:**

50% plan set with estimate. Draft Special Contract Requirements (SCRs) are recommended, but not required at this point.

#### **Completion of Activity:**

Submit the 50% plan set with estimate to DTL/HDM for review.

**Additional Supporting Documentation:**

[PDDM Section 9.4 PS&E DEVELOPMENT](#)

**PDDM WFL Supplement 9.7:** Section 9.4 PS&E Development – Subsection H.  
Reviews

[Acronym List](#)

**Applicable PRMS Codes:**

D00003

D00005

DES\_VE

## **Activity Definition**

### **Intermediate Review**

#### **Receivables/Inputs:**

50% plan set with estimate

#### **Activity Description:**

The purpose of this task is to perform internal and external reviews of the 50% design package.

#### **Designer Guidance:**

Depending on the complexity of the project, this task may be abbreviated, as approved by the HDM/PM. Allow 1-2 weeks for each review, depending on project complexity. The scheduled reviews are as follows:

1. **DTL/HDM Review.** Provide the intermediate plans and estimate to the DTL/HDM for a QA/QC Review. The DTL/HDM will perform a line and grade review using the [Quality Assurance/Quality Control Checklist](#) as a guide. The reviewer's focus at this phase will be ensuring that the design adheres to the following:
  - a. It is context sensitive;
  - b. It minimizes or avoids resource impacts;
  - c. It is cost-effective and constructible;
  - d. It integrates environmental mitigation and stipulations;
  - e. All appropriate design and drafting standards are being utilized in the development of the PS&E package.
2. **Internal Review.** Document resolutions to DTL/HDM Review comments. Perform revisions to the plans and provide copies of the revised plan set to the CFT, Design Quality and Safety Engineer, Highway Safety Engineer, and Construction Quality Assurance Specialist (CQAS).
3. **External Review.** The External Review may consist of an office review and/or a field review at the project site. Coordinate and document resolutions to comments from the Internal Review. Revise the PS&E package and provide copies of the revised plans and specifications to the external agencies prior to the external review. For Forest Highway projects, the external review will typically include all SEE (Social, Economic, and Environmental) Team members. For Park Roads projects, the attendees will typically consist of CFT members, Park representatives and DSC representatives, as requested. Prepare any presentation materials/visualizations as necessary to appropriately convey



design information to the meeting attendees. Accompany the PM/HDM to the external field review and provide technical input as needed.

**Deliverables/Outputs:**

1. Summary of comments resulting from the external review.
2. [Trip report](#) discussing accomplishments/decisions made at the intermediate field review, as applicable.

**Completion of Activity:**

The intermediate external review is completed.

**Additional Supporting Documentation:**

**PDDM WFL Supplement 9.7:** Section 9.4 PS&E Development –  
Subsection H. Reviews

[Acronym List](#)

**Applicable PRMS Codes:**

D00005A  
D00005B  
D00007

## **Activity Definition**

### **Intermediate Design Revisions**

**Receivables/Inputs:**

Summary of comments resulting from the intermediate external review

**Activity Description:**

The purpose of this task is to provide a PS&E package of sufficient detail to apply for applicable permits, to allow for preliminary roadway staking, and to prepare final ROW/utility plans, as applicable.

***Designer Guidance:***

Document resolutions to the intermediate external review comments and revise the plan set accordingly. Finalize construction limits. Assist the Environmental Specialist in drafting the permit applications as needed, including the Storm Water Pollution Prevention Plan (SWPPP) and erosion control plans. Provide revised cross-sections and staking data to the Survey Branch if staking for the Plan-in-Hand (PIH) review will be required.

**Deliverables/Outputs:**

1. Intermediate design package
2. Staking notes (cross-sections, slope stakes, centerline) as required
3. Sufficiently detailed plans to apply for permits

**Completion of Activity:**

1. Permit application(s) completed by environment
2. Preliminary staking data submitted to survey
3. Intermediate design package submitted to ROW for drafting of final ROW/utility plan

**Additional Supporting Documentation:**

[PDDM Chapter 9.4.G Right-of-Way and Utilities](#)

[Acronym List](#)

**Applicable PRMS Codes:**

D00008  
E00006  
E00007  
E00007A

## **Activity Definition**

### **Prepare Plan-in-Hand (PIH) PS&E**

#### **Receivables/Inputs:**

Intermediate design package

#### **Activity Description:**

The purpose of this task is to complete the PS&E package to 70%. The PIH PS&E should include a plan set with all major design elements addressed (grading, parking areas, drainage, structures, erosion control, traffic control), cross-sections, a draft set of SCRs, and a complete estimate of all pay items with their associated quantities.

#### **Designer Guidance:**

Assemble a complete set of SCR's. Obtain feedback from environment and ROW on appropriate sections of the SCRs. Determine all pay items to be used in the contract and calculate the associated quantities. Provide quantity tables and a summary of quantities in the plan set. Further develop the plan sheets to adequately support work items called out in the plans. Compile a complete estimate using the WFL Engineer's Estimate program.

Complete the Roadside Design Guide portion of the [Highway Design Standards Form](#)

Review the scheduled advertisement date to determine if pre-advertisement is appropriate for the contract. If so, supply Acquisitions with requested plan sheets and SCRs as well as a completed [fedbizopps form](#).

#### **Deliverables/Outputs:**

70% PS&E package

#### **Completion of Activity:**

The PIH PS&E is submitted to HDM/DTL for review.

#### **Additional Supporting Documentation:**

[PDDM Chapter 9.4.K](#) Specifications

[PDDM Chapter 9.4.J](#) Engineer's Estimate

[Acronym List](#)

#### **Applicable PRMS Codes:**

D00009

D00010

## Activity Definition

### PIH Review

#### Receivables/Inputs:

70% PS&E package

#### Activity Description:

The purpose of this task is to perform internal and external reviews of the 70% PIH PS&E package.

#### Designer Guidance:

Allow 1-2 weeks for each review, depending on project complexity. The scheduled reviews are as follows:

1. **DTL/HDM Review.** Provide the PIH package and Design Book to the DTL/HDM for a QA/QC Review. The DTL/HDM will perform a full review of the plans and specifications using the [Quality Assurance/Quality Control Checklist](#) as a guide. The reviewer will use the Design Book to verify quantity support calculations and unit price analysis.
2. **Internal Review.** Document resolutions to DTL/HDM Review comments. Perform revisions to the PS&E package. Provide copies of the revised plans and SCR's to the CFT, Design Quality and Safety Engineer, Highway Safety Engineer, and CQAS.
3. **PIH Field Review.** Coordinate and document resolutions to comments. Revise the PS&E package to reflect resolutions of the review comments and provide copies of the revised plans and specifications to the external agencies. Accompany the PM/HDM to the external field review and provide technical input as needed. Other attendees will typically consist of CFT members, the SEE Team, and agency representatives. Complete a [Trip Report](#) to document proposed changes, action items, and discussion points at the field review.

#### Deliverables/Outputs:

1. Summary of comments resulting from the field review.
2. Trip report discussing accomplishments/decisions made at the PIH field review.

#### Completion of Activity:

The PIH Field review is completed.

**Additional Supporting Documentation:**

**PDDM WFL Supplement 9.7:** Section 9.4 PS&E Development –  
Subsection H. Reviews

[Acronym List](#)

**Applicable PRMS Codes:**

D00010A  
D00010B  
D00011B  
D00012

## Activity Definition

### Final Design

#### Receivables/Inputs:

Receive comments from the PIH field review.

#### Activity Description:

The purpose of this task is to advance the PS&E package to the 95% level. All design details will be incorporated in the plan sheets at this point, as well as a complete set of SCRs and a comprehensive Critical Path Method (CPM) schedule.

#### **Designer Guidance:**

Revise the PS&E package to reflect resolutions to PIH field review comments. Send documented resolutions to the attendees of the PIH field review.

If the project is to have contract options or is to be a best-value negotiated contract, notify Acquisitions and draft the appropriate request letters

Route the completed *Highway Design Standards Form* for signature.

Complete the *fedbizopps form* at least 6 weeks prior to sign-off and deliver to Acquisitions.

#### Deliverables/Outputs:

95% PS&E package

#### Completion of Activity:

Final PS&E package submitted to DTL/HDM for a QA/QC review.

#### Additional Supporting Documentation:

[Best-value request letter](#)

[Options letter](#)

[CPM tips sheet](#)

**PDDM WFL Supplement 9.7:** Section 9.4 PS&E Development – Subsection H. Reviews

[Acronym List](#)

#### Applicable PRMS Codes:

D00013

D00014

D00015

## **Activity Definition**

### **Final Design Review**

#### **Receivables/Inputs:**

95% PS&E package

#### **Activity Description:**

The purpose of this task is to perform internal and external reviews of the 95% Final review package.

#### **Designer Guidance:**

Allow 1-2 weeks for each review, depending on project complexity.  
The scheduled reviews are as follows:

**DTL/HDM Review.** Provide the 95% PS&E package to the DTL/HDM for a QA/QC Review. The reviewer will ensure that all work items, design details, and SCRs have been included in the PS&E package and that appropriate design and drafting standards have been met according to the [Quality Assurance/Quality Control Checklist](#).

**Internal and External Review.** Document resolutions to DTL/HDM Review comments. Perform revisions to the PS&E package. Provide copies of the revised plans and SCRs to the external agency/SEE Team, CFT, Design Quality and Safety Engineer, Highway Safety Engineer, CQAS, and Specification Engineer (optional). Provide the completed and signed [Highway Design Standards Form](#) to the Design Quality and Safety Engineer. Ensure final Geotechnical Reports, permits, and ROW/Utility agreements are completed. Send title sheet of plans to appropriate agency(s) for signature.

#### **Deliverables/Outputs:**

Summary of comments resulting from the final review.

#### **Completion of Activity:**

The Internal and External final reviews are completed.

#### **Additional Supporting Documentation:**

**PDDM WFL Supplement 9.7:** Section 9.4 PS&E Development – Subsection H. Reviews

[Acronym List](#)

**Applicable PRMS Codes:**

D00015A

D00016

D00016A

C00004A



## **Activity Definition**

### **PS&E Sign-Off**

#### **Receivables/Inputs:**

Receive review comments from final review package.

#### **Activity Description:**

The purpose of this activity is to advance the PS&E package and CPM schedule to the 100% level so that the package is ready for advertisement.

#### ***Designer Guidance:***

Document resolutions to final review comments and revise the PS&E package accordingly. Finalize any details necessary to complete the package to 100%. Assist the Environmental Specialist in completion of the Mitigation Commitment Summary (Environmental Checklist).

Compile supporting documentation for the PS&E package sign-off book. Refer to the [Design to PS&E Checklist](#) for a list of required documentation.

Route the sign-off package through the CFT for required signatures. Minor design revisions may be necessary as the CFT reviews the PS&E package during the sign-off process.

Submit the sign-off package to the DTL/HDM for a QA review. This review typically evaluates the completeness of the sign-off book and package before submittal to Acquisitions. Make revisions to the sign-off package as necessary.

Submit CFT-recommended sign-off package to Project Development Engineer for signature.

Deliver sign-off package and supporting documentation to Acquisitions.

#### **Deliverables/Outputs:**

Completed sign-off package and supporting documentation.

#### **Completion of Activity:**

The completed sign-off package and supporting documentation are delivered to Acquisitions, and the PM sends the delivery notice to the appropriate parties.

**Additional Supporting Documentation:**

**PDDM WFL Supplement 9.7:** Section 9.4 PS&E Development –  
Subsection H. Reviews

[Acronym List](#)

**Applicable PRMS Codes:**

D0016B

D00017

## **Activity Definition**

### **Contract Support**

#### **Receivables/Inputs:**

Completed sign-off package and supporting documentation delivered to Acquisitions.

#### **Activity Description:**

The purpose of this task is to provide design support to Acquisitions during contract Advertisement and Award process.

#### ***Designer Guidance:***

Respond to inquiries about the contract from Acquisitions and provide design information as requested. When requested, prepare responses to questions from potential bidders or assist with the preparation of amendments.

For Negotiated Best-Value contracts, the Designer, PM, and/or HDM may be required to assist in the negotiation process and provide support data for price discrepancies.

If the low bid exceeds the obligated amount, a unit price analysis may be required by the CFT to determine if the bid prices are fair and reasonable.

Prepare the staking data and Project Engineer (PE) Hold file. Provide the staking data and PE Hold file to the HDM/DTL for a QA check.

Send [customer surveys](#) to external customers.

#### **Deliverables/Outputs:**

1. Completed PE Hold File and staking data
2. Customer survey

#### **Completion of Activity:**

The Contract is awarded by Acquisitions.

#### **Additional Supporting Documentation:**

[PE Hold File checklist](#)  
[PDDM Chapter 9.4.L](#)    [Contract Assembly](#)  
[Acronym List](#)

#### **Applicable PRMS Codes:**

D00018

## **Activity Definition**

### **Preliminary Survey & Mapping**

#### **Receivables/Inputs:**

1. Completed scoping document (PA or PIR), including a list of alternatives to be evaluated.
2. Project delivery schedule (PRMS)
3. Project account and budget established in PRMS
4. Completed Survey Request submitted by Project Development

#### **Activity Description:**

The purpose of this task is to conduct preliminary survey and mapping for all alternatives that are presented in the Environmental Document. This work may be completed in-house or by a contractor.

#### **Deliverables/Outputs:**

1. Completed mapping for use by Project Development

#### **Completion of Activity:**

The survey is completed in the field, and mapping is completed for Project Development.

#### **Additional Supporting Documentation:**

[Acronym List](#)

#### **Applicable PRMS Codes:**

S00002  
S00003

## **Activity Definition**

### **Right-of-way (ROW) & Utility Location**

#### **Receivables/Inputs:**

Preliminary plans submitted from Project Development to ROW indicating proposed construction limits and existing utilities.

#### **Activity Description:**

The purpose of this task is to identify potential ROW and utility conflicts along the project corridor and notify the affected parties. Utility conflicts may consist of overhead or underground power, communications, fuel and water lines as well as irrigation ditches and canals. Land access conflicts may occur with private landowners, other government entities, or Native American tribes. ***Note: The processing of railroad agreements and the preparation of plans for railroad encroachment projects are typically time consuming operations. If the project has the potential to impact a railroad, the railroad agreement process should begin as soon as possible to prevent delays in the project schedule. Refer to the PDDM for more information on railroad agreements.***

The ROW Specialist obtains title reports, copies of deeds and any other documents about existing right-of-way. The ROW Specialist will examine these documents along with the preliminary plans for easements or other encumbrances to reveal the existence and location of waterlines, conduits, drainage or irrigation lines, or other features affecting construction. The ROW Specialist will send a letter to affected parties notifying them of the potential conflict. ROW may request further project information from the designer as necessary and as it becomes available.

#### **Deliverables/Outputs:**

Letter to affected parties.

#### **Completion of Activity:**

Letters are sent to affected parties and the preparation of final ROW/utility plan begins.

#### **Additional Supporting Documentation:**

[\*\*PDDM Chapter 9.4.G Right-of-Way and Utilities\*\*](#)

[Acronym List](#)

#### **Applicable PRMS Codes:**

R01PLAT  
R04PLAN

## **Activity Definition**

### **Preliminary Staking**

**Receivables/Inputs:**

Preliminary staking data submitted from Project Development

**Activity Description:**

The purpose of this task is to conduct preliminary staking of centerline, stations stakes, slope stakes, clearing limits, and reference points as requested for the PIH Review.

**Deliverables/Outputs:**

Not Applicable

**Completion of Activity:**

Staking is completed in the field.

**Additional Supporting Documentation:**

[Acronym List](#)

**Applicable PRMS Codes:**

S00008  
S0SLOPE  
S0CLSTK

## **Activity Definition**

### **Right-of-way (ROW) Acquisition & Utility Agreements**

**Receivables/Inputs:**

Intermediate plans submitted from Project Development to ROW for drafting of final ROW/utility plan

**Activity Description:**

The purpose of this task is to draft the final ROW/utility plans and negotiate and acquire right-of-way and utility relocation agreements.

The ROW Specialist will prepare final ROW/utility plans and descriptions using the intermediate design package provided by the designer. The plans and descriptions will be submitted to the external agency for ROW acquisition. ROW agreements are then negotiated with landowners.

A separate utility agreement is negotiated with the utility company, which includes a relocation plan and responsible party.

**Deliverables/Outputs:**

ROW and Utility agreements.

**Completion of Activity:**

ROW is acquired and Utility agreements are finalized and provided to PM.

**Additional Supporting Documentation:**

[PDDM Chapter 9.4.G Right-of-Way and Utilities](#)

[Acronym List](#)

**Applicable PRMS Codes:**

R04PLAN  
R05PKG  
U02PKG  
R08AGRE  
U05AGRE

## **Activity Definition**

### **Preliminary Environmental Review**

#### **Receivables/Inputs:**

1. Completed scoping document (PA or PIR) establishing the Purpose and Need for the project
2. Environmental and Project Delivery schedule (PRMS)

#### **Activity Description:**

Several pre-NEPA tasks are accomplished during this activity. Depending upon which program is employed, WFL must be established as either the Lead or Cooperating Agency. For the Forest Highway Program (FHP), WFL is the lead agency for NEPA. For the Parks Road Program (PRP), the Park Service is the lead agency for NEPA and WFL participates as a cooperating agency. The lead agency is responsible for all aspects of NEPA.

Purpose and Need should already be established for the project, but may need to be supplemented or revised to further address NEPA requirements. On projects where a law, Executive Order (EO), or regulation (Section 4(f), EO 11990 or EO 11988) mandates an evaluation of avoidance alternatives, the explanation of the project need should be more specific so that avoidance alternatives that do not meet the stated project need can be readily dismissed. A range of alternatives should be established, with the goal of eventually developing the preferred alternative for the project.

The Environmental Specialist will prepare the Public Involvement Plan (PIP) for the project. This will include activities related to public involvement for the project, such as the establishment of a mailing list, project milestones and circulation of the public notice. The Environmental Specialist should also plan and conduct the first public meeting or open house for the project during this phase.

For Forest Highway Projects, work on the Project Checklist should begin at this point. The environmental responsibility in the project checklist includes the "affected environment" section and the environmental checklist portion at the end of the document. The design staff is responsible for the remainder of the document, which is a location document with engineering details. For the PRP, the Environmental Work Plan is completed by the Park.



**Deliverables/Outputs:**

1. Establish Lead vs. Cooperating Agency status
2. PIP
3. Project Checklist or Environmental Work Plan
4. First public involvement meeting conducted

**Completion of Activity:**

The first public involvement meeting is conducted.

**Additional Supporting Documentation:**

[PDDM Chapter 3 ENVIRONMENT](#)

[PDDM Section 4.3 INFORMATION GATHERING](#)

[PDDM Section 4.4 LOCATION ANALYSIS](#)

[PIP example](#)

[Project Checklist example](#)

[Acronym List](#)

**Applicable PRMS Codes:**

E00001

E00002A

## **Activity Definition**

### **Environmental Resource Surveys**

**Receivables/Inputs:**

Project Checklist or Environmental Work Plan

**Activity Description:**

The purpose of this task is to collect resource reconnaissance for the proposed project limits. This usually entails resource survey data collected within the road corridor, so as to encompass any possible alternatives, as well as outlying material sources, waste and staging areas, and possible detours necessary for road construction.

For Park Roads projects, the NPS will arrange for resource surveys to be performed and produce associated reports and recommendations to other consultation agencies.

For Forest Highway projects, WFLHD typically hires a contractor to perform the resource surveys. The Environmental Specialist acts as the COTR (Contracting Officer's Technical Representative), composing the Statement of Work (SOW) and monitoring the progress of work. The COTR is also responsible for billing on the contract. The SOW should request separate survey and manage reports for each resource survey. The survey report is the data collected in the field. The manage report gives impacts and assessment suggestions that may be used in later documentation for consultation, permitting and NEPA documents.

**Deliverables/Outputs:**

1. Resource mapping information (wetlands, archaeological sites, etc.) that will be used in the drafting of the NEPA documents, resource agency consultation, and permitting processes.
2. Survey and Manage Reports for biology, wetlands and cultural resources

**Completion of Activity:**

The resource reports are prepared.

**Additional Supporting Documentation:**

[PDDM Chapter 3 ENVIRONMENT](#)

Example of SOW for resource surveys

[Acronym List](#)

**Applicable PRMS Codes:**

E00002B

## **Activity Definition NEPA Preparation**

### **Receivables/Inputs:**

Resource mapping information (wetlands, archaeological sites, etc.) to be used in the drafting of the NEPA documents, resource agency consultation, and permitting processes.

### **Activity Description:**

The primary purpose of this activity is to provide NEPA support and scoping in preparation for the NEPA document. During this activity, the necessary pre-NEPA documents are clarified, prepared, and outlined to allow the NEPA process to move forward. These documents include Biological Assessments (BA), Cultural Resource Surveys, and consultations with appropriate resource agencies.

For Park Roads projects, the NPS will typically draft the BA and consult with necessary resource agencies. For Forest Highway projects, the WFLHD Environmental Specialist drafts or serves as a COTR for the drafting of the BA, and consults with necessary resource agencies.

Endangered Species Act (ESA), Section 7 consultation should begin in this phase. ESA consultation takes one of two forms: informal consultation (30 days) or formal consultation (135 days). Consultation results in either a concurrence letter or a Biological Opinion (BO) on the effects to threatened and endangered species resulting from the project. A BA is required for both informal and formal consultation. The BA is the mechanism that will start consultation with the United States Fish and Wildlife Service (USFWS) or National Oceanic and Atmospheric Administration (NOAA) Fisheries. USFWS consults on threatened and endangered species (wildlife/plants/fish) as well as candidate species and critical habitat. NOAA Fisheries consults on anadromous fish and critical habitat that may be affected by the project. These consultations may be conducted separately or together, but a BA is required by both agencies.

Cultural resource consultation is undertaken with the State Historic Preservation Officer (SHPO) or with the Tribal Historic Preservation Officer (THPO) on Reservation lands where the tribe has assumed the responsibilities of the SHPO. This requires the preparation of a cultural resources report by a professional acceptable to the SHPO/THPO. The time necessary to obtain the professional services, inventory and generate the report will vary depending upon the size, scope and complexity of the proposed project, as well as the presence and type of cultural resources within the project area.

Wetland resource mapping is used to illustrate and discuss any impacts that the project may have to wetlands within the project vicinity. A watershed analysis may be performed to illustrate the effects to a particular watershed in the project area. The USACE (United States Army Corps of Engineers) is responsible for regulating impacts to wetlands and waters of the United States. This is an important step in the preparation of both state and federal permits that may be required for the project, as well as the determination of any wetland mitigation requirements.

Any preliminary investigatory studies should begin in this phase. In the case of preliminary geotechnical investigations (drilling), consultation and permits may be necessary. The Environmental Specialist coordinates with the Geotechnical representative in gaining compliance for the activities required for the project.

**Deliverables/Outputs:**

1. BA for Section 7 consultation (formal consultation is 135 days; informal consultation is approximately 30 days)
2. Wetland delineations and hydrological assessments

**Completion of Activity:**

A BA is developed and consultations with the USFWS and NOAA are initiated if needed. Cultural resource consultation is initiated.

**Additional Supporting Documentation:**

[PDDM Section 3 ENVIRONMENT](#)

Example BA

ESA Section 7 Handbook

[Acronym List](#)

**Applicable PRMS Codes:**

E00001

## **Activity Definition**

### **Prepare Categorical Exclusion**

#### **Receivables/Inputs:**

1. Completed BA
2. USFWS and/or NOAA Fisheries consultation
3. SHPO or THPO cultural resource consultation
4. Wetland delineations and hydrological assessments
5. Concurrence letters (or BO) for consultations

#### **Activity Description:**

The purpose of this task is to complete a Categorical Exclusion (CE) document for actions or activities which meet the definition in 23 CFR 771.11(a) and do not have significant environmental impacts. CEs are divided into two groups based on the action's potential for impacts.

The first group is a list of 20 categories of actions in 23 CFR 771.117(c) which never or almost never cause significant environmental impacts, such as non-construction actions (planning, grants or research programs) or limited construction activities (pedestrian facilities, landscaping or fencing). These actions are automatically classified as CEs and do not require approval or documentation. However, other environmental laws may still apply, such as Section 4(f) clearances or Section 7 of the ESA.

The second group consists of actions with a higher potential for impacts than the first group, but which still meet the criteria for CEs. The actions in this group can be covered by 23 CFR 771.117(d), and because of the potential for impacts, these actions require some information to be provided to determine the proper CE classification. The level of information that is necessary should be commensurate with the action's potential for adverse environmental impacts. The level of analysis should be sufficient to define the extent of impacts, identify appropriate mitigation measures, and address known and foreseeable public and agency concerns. Unusual circumstances where further environmental studies will be necessary to determine the appropriateness of a CE classification are listed in 23 CFR 771.117(b).

For Forest Highway projects, the Environmental Specialist prepares the CE and 4(f) document if applicable. For NPS Projects, the Park generally prepares a CE. Once the Park CE has been signed, the Environmental Specialist then prepares a FHWA CE.

The Environmental Manager signs CEs, which do not need to be submitted for review to the Division Environmental Review Team (DERT).

**Deliverables/Outputs:**

1. The CE is completed.
2. The 4(f) document, if applicable, is completed.

**Completion of Activity:**

The CE and the final 4(f) document, if applicable, are signed.

**Additional Supporting Documentation:**

[PDDM Chapter 3 ENVIRONMENT](#)

[Link to 40 CFR 1508.4](#)

[CE example](#)

[4\(f\) example](#)

[Acronym List](#)

**Applicable PRMS Codes:**

E00003

## **Activity Definition**

### **Prepare Environmental Assessment**

#### **Receivables/Inputs:**

1. Completed BA
2. USFWS and/or NOAA Fisheries consultation
3. SHPO or THPO Cultural resource consultation
4. Wetland delineations and hydrological assessments
5. Determination that a CE is inadequate to cover the proposed project
6. Concurrence letters (or BO) for consultations

#### **Activity Description:**

The purpose of this task is to complete an Environmental Assessment (EA) for actions where a CE is inadequate, due to the anticipated environmental impacts of the project. If it is uncertain whether the project is a major action with significant impacts, then the next step in the process is to proceed to an EA. The primary purpose of an EA is to help decide whether or not an Environmental Impact Statement (EIS) is necessary.

The EA should address only those resources or features that will likely be significantly impacted. The EA should be a concise document and should not contain long descriptions, detailed information that may have been gathered, or analyses that may have been conducted for the proposed action. Although there are no page limits in any regulations, the Council on Environmental Quality (CEQ) recommends that an EA should generally be less than 15 pages. To minimize volume, the EA should use good quality maps and exhibits. The EA should also incorporate, reference, and summarize background data and technical analyses to support concise discussions of alternatives and their impacts. CEQ suggests that the following format and content is appropriate for an EA:

- Cover sheet
- Purpose and need for action
- Alternatives
- Impacts
- Comments and coordination
- Appendices (if any)
- Section 4(f) analysis (if any)
- Revisions

For Forest Highway projects, the Environmental Specialist prepares the draft EA document, and, if applicable, the draft 4(f) document, which are then reviewed by the DERT. Once internal review is complete, the draft documents are sent out for external review by the SEE team, to obtain approval for public circulation. When this approval is obtained, the

Environmental Specialist prepares a Public Notice, and the document is distributed to the public. A 30 – 45 day comment period is extended for public review, and comments are received. During this time, the Environmental Specialist prepares the final 4(f) document, if applicable. At the end of the comment period, the Environmental Specialist prepares an amended EA to address the comments received, and submits the EA for a final DERT review. When DERT approval is received, the approved amended EA is ready for approval and signature by the Director of Project Delivery.

For NPS Projects, the Park generally prepares the EA and appropriate documents. As a cooperating agency, FHWA works closely with the Park during their NEPA process and preparation of the NEPA documents. The DERT team reviews the EA prepared by the Park.

At this time, a decision is made as to whether an EIS is required.

**Deliverables/Outputs:**

1. The final EA is completed.
2. The final 4(f) document is completed, if applicable

**Completion of Activity:**

The EA and the final 4(f) document, if applicable, are signed and approved.

**Additional Supporting Documentation:**

[PDDM Western Supplement Chapter 3 ENVIRONMENT](#)

[Link to 40 CFR 1508.13](#)

[EA example](#)

[4\(f\) example](#)

[Acronym List](#)

**Applicable PRMS Codes:**

E00003



## **Activity Definition**

### **Prepare Finding of No Significant Impact**

#### **Receivables/Inputs:**

1. Completed EA
2. Final 4(f) document if applicable
3. Preferred alternative is chosen

#### **Activity Description:**

The purpose of this task is to prepare the Finding of No Significant Impact (FONSI). The preparation of this document follows the preparation of the EA in the NEPA process. The EA and any attachments should adequately document the basis for the FONSI.

For Forest Highway projects, the Environmental Specialist prepares the FONSI after a review of the EA, during which the proposed action is determined to have no significant impacts. This determination is documented by attaching a separate statement to the EA that clearly sets forth conclusions.

The FONSI describes compliance with NEPA and other applicable environmental laws, EOs, and related requirements. If the FONSI must be prepared before full compliance with these other requirements is achieved, the FONSI must describe consultation with the appropriate agencies, and how and when the requirements will be met.

FONSIs do not need to be formally distributed, but a Notice of Availability (NOA) must be sent to Federal, State, and local government agencies that are likely to have an interest in the project. Agencies that provided commented on the EA should be advised of the project decision, as well as on the disposition of their comments. The Environmental Specialist should provide a copy of the FONSI to commenting agencies, which helps foster open communication between agencies.

For Forest Highway Projects, the FONSI is prepared by the Environmental Specialist. A DERT review is conducted on the final 4(f) document and FONSI. Once the DERT review is concluded, the FONSI is ready for approval and signature by the Director of Project Delivery.

For NPS Projects, the Park generally prepares the FONSI. As a cooperating agency, FHWA works closely with the Park during their NEPA process and preparation of the appropriate documents. FHWA adopts the approved Park FONSI.

**Deliverables/Outputs:**

1. The final FONSI is completed.
2. The final signed 4(f) document is completed.
3. For NPS projects, the FHWA adoption of the NPS FONSI is completed.

**Completion of Activity:**

The FONSI and the final 4(f) document are approved, signed, and distributed to commenting agencies. For park projects, an adoption document is completed.

**Additional Supporting Documentation:**

[PDDM Western Supplement Chapter 3 ENVIRONMENT](#)

40 CFR 1508.13

FHWA TA 6640.8A

[FONSI example](#)

[4\(f\) example](#)

[Acronym List](#)

**Applicable PRMS Codes:**

E00003

E00005

## **Activity Definition**

### **Prepare Environmental Impact Statement**

#### **Receivables/Inputs:**

1. Completed BA
2. USFWS and/or NOAA Fisheries consultation
3. SHPO or THPO cultural resource consultation
4. Wetland delineations and hydrological assessments
5. Determination that:
  - A CE is inadequate to cover the proposed project
  - An EA and FONSI are inadequate to cover the proposed project
6. Concurrence letters (or BO) for consultations

#### **Activity Description:**

The purpose of this task is to complete an Environmental Impact Statement (EIS) for actions where an EA and FONSI are inadequate, due to the anticipated environmental impacts of the project. An EIS is required for actions that individually or cumulatively have significant environmental impacts. Specific regulations govern an EIS.

The first step in this process is to file a Notice of Intent (NOI) in the Federal Register. There is a 15-day minimum waiting period after filing the NOI.

Scoping for the EIS begins with the establishment of milestones and planning for a series of public meetings appropriate for the project. At this time, the preferred alternative may not yet be established, and therefore all alternatives must be scoped. Public and agency participation is required for an EIS. For administrative and record keeping purposes, the EIS should be printed on 8½ x 11-inch paper with 11 x 17-inch foldout sheets for graphics. For consistency with CEQ regulations, the following standard format should be used:

- Cover sheet
- Summary
- Table of contents
- Purpose of and need for action
- Alternatives
- Environmental consequences
- List of preparers
- List of agencies, organizations, and persons to whom copies of the statement are sent
- Comments and coordination
- Index
- Appendices (if any)

A complete description of these actions is covered in 23 CFR 771.115.

For Forest Highway Projects, the Environmental Specialist prepares the Draft Environmental Impact Statement (DEIS), and, if applicable, a draft 4(f) document, and submits these documents for DERT review. The Environmental Specialist also prepares a public notice, and submits the documents for internal and SEE team reviews.

For Forest Highway Projects, the next steps include publishing the Notice of Hearing (NOH) in the Federal Register, with a minimum 30 day waiting period prior to conducting the public hearing; filing the DEIS with the Environmental Protection Agency (EPA); and publishing a NOA with the Federal Register. There is a minimum 60 day public and peer review period and a 90 day review period for the DEIS. During this time, consideration and response is given to the comments provided internally, as well as by the public, cooperating agencies, and other agencies. This comment period is 30 calendar days.

For Forest Highway Projects, the Environmental Specialist prepares the Final Environmental Impact Statement (FEIS) for internal review and clearance (30 – 45 days), and final DERT review. Additionally, the public notice and final 4(f) document should be prepared and permit application preparation can begin. The FEIS is reviewed and prepared for approval and signature by the Division Engineer.

For NPS Projects, the Park generally prepares the DEIS and FEIS. As a cooperating agency, FHWA works closely with the Park during their NEPA process and preparation of the appropriate documents. FHWA adopts the approved Park FEIS.

**Deliverables/Outputs:**

1. NOI filed in the Federal Register
2. Completed DEIS
3. Completed FEIS
4. NOH and NOA filed in the Federal Register

**Completion of Activity:**

The FEIS and final 4(f) document, if applicable, are approved and signed. For park projects, FHWA adopts the park FEIS.

**Additional Supporting Documentation:**

**PDDM Western Supplement Chapter 3 ENVIRONMENT**

Link to 40 CFR 1503

Link to FHWA TA 6640.8A

NOI example  
[DEIS example](#)  
FEIS example  
[4\(f\) example](#)  
[Acronym List](#)

**Applicable PRMS Codes:**  
E00003

## **Activity Definition**

### **Prepare Record of Decision**

#### **Receivables/Inputs:**

Completed FEIS

#### **Activity Description:**

The purpose of this task is to prepare the Record Of Decision (ROD). This is the final step in the NEPA process. There is a limit on any action with the project until the ROD is issued. The ROD will explain the reasons for the project decision, summarize any mitigation measures that will be incorporated in the project, and document any required Section 4(f) approval. The ROD must explain the basis for the project decision as completely as possible, based on information contained in the FEIS; however, it is appropriate to cross-reference and incorporate other documents by reference. The following key items need to be addressed in the ROD:

- Decision
- Alternatives considered
- Section 4(f) if applicable
- Measures to minimize harm
- Monitoring or enforcement program
- Comments on FEIS

The environmentally preferred alternative is selected and rationale is given for that selection. The environmentally preferred alternative is the alternative that best promotes the NEPA policies and the alternative that causes the least amount of damage to the environment. Concurrently, the agency preferred alternative is also selected, with rationale given to support that selection. The agency preferred alternative is one that will fulfill the agency's statutory mission and responsibilities, giving consideration to economics, environment, technical and other factors.

Mitigation measures are designed and issued. This includes mitigation and monitoring plans dictated in the NEPA document, as well as any mitigation that may be issued from the permitting or regulatory agencies and mitigation designed to compensate for any effects to endangered, threatened, or special concerns.

For Forest Highway projects, the Environmental Specialist completes the ROD, which is then reviewed by the DERT. After the final DERT review, the ROD is delivered to the Division Engineer for final approval and signature. A public notice is prepared, and the ROD is distributed for public and agency review.

For NPS Projects, the Park generally prepares the ROD. As a cooperating agency, FHWA works closely with the Park during their NEPA process and preparation of the appropriate documents. FHWA adopts the approved Park ROD.

**Deliverables/Outputs:**

The preferred environmental alternative and the preferred agency alternative are chosen, and the ROD is created.

**Completion of Activity:**

The ROD is signed and approved. For NPS projects, FHWA adopts the Park ROD.

**Additional Supporting Documentation:**

[PDDM Western Supplement Chapter 3 ENVIRONMENT](#)

40 CFR 1502.2

FHWA TA 6640.8A

[ROD example](#)

[Acronym List](#)

**Applicable PRMS Codes:**

E00003

E00005

## **Activity Definition**

### **Permits**

#### **Receivables/Inputs:**

1. Completed NEPA document
2. Supporting resource surveys

#### **Activity Description:**

The purpose of this task is to obtain required permits for the project.

Regardless of the program implemented (Park Roads or Forest Highways), the Environmental Specialist will prepare the permit package, obtaining all applicable data and drawings necessary to complete the application package, and is responsible for transmitting permit packages to the appropriate permitting agencies associated with the project. These permits include all applicable Federal, State or local permits necessary to complete the project.

Applicable permits include: Section 404 Clean Water Act Permit, Storm Water Permit (MPDES for Montana, WYPDES for Wyoming, or NPDES for other states); state permits for stream protection and stream alteration, and also state permits tied into the federal nexus to include the 401 Clean Water Act permit. There may also be other state and local permits that apply to the project. The permit coordinator will advise as to what permits are necessary and the time frames necessary to allow for those permits. Usually, if the Corps of Engineers issues an individual 404 permit, the process can take as long as 120 days, including the time required for the Corps to go out for public notice for 30 days. For Nationwide Permits from the Corps, the time period is usually reduced to 30 – 45 days, but may require pre-construction notices before those permits can be issued. Additionally, the Forest Service may issue Special Use Permits to allow entry and action on permitted areas in the National Forest.

The Environmental Permits Coordinator will assist the Environmental Specialist in preparing the permit packages, obtaining the necessary information for permit applications and renewal of any permits during the life of the project. After the project is completed, some permits may require filing termination notices in order to stay in compliance with the various state and federal agencies. Some permits are contingent upon reestablishment of vegetation at the site or establishment of mitigation required for the project. Permit requirements can vary from state to state, as can the time periods necessary to obtain those permits. All permits must go through the environmental permit coordinator so that they are



logged into the system. This will allow for reminders and notices of impending permit renewals when necessary.

**Deliverables/Outputs:**

Applicable permits issued for project

**Completion of Activity:**

Permits are obtained from the appropriate agencies and distributed as needed.

**Additional Supporting Documentation:**

[PDDM Section 3 ENVIRONMENT](#)

Example Permit Application

[Acronym List](#)

**Applicable PRMS Codes:**

E0007A

E0007B

## **Activity Definition**

### **Mitigation Commitment Summary**

#### **Receivables/Inputs:**

1. Completed NEPA document (CE, EA/FONSI, or FEIS)
2. Completed 4f documentation, if applicable
3. Appropriate permits have been received for the project

#### **Activity Description:**

The purpose of this task is to document how environmental commitments for a project will be accomplished. The Environmental Specialist will complete a Mitigation Commitment Summary, also known as an environmental checklist. The Mitigation Commitment Summary will list all mitigation commitments included in NEPA documents and permits. In addition, the summary will also document how each mitigation commitment will be accomplished for the project. The designer may be asked to assist with preparation of the summary by directing the Environmental Specialist to locations where mitigation commitments are addressed in the plans and specifications. The final Mitigation Commitment Summary is included in the sign-off package.

The final Mitigation Commitment Summary will be completed before PS&E sign-off. However, the mitigation commitments should be addressed in the plans and specifications as early as possible.

#### **Deliverables/Outputs:**

Mitigation Commitment Summary

#### **Completion of Activity:**

The Mitigation Commitment Summary is prepared by the Environmental Specialist and included in the sign-off package.

#### **Additional Supporting Documentation:**

[PDDM Western Supplement Chapter 3 ENVIRONMENT](#)  
[Mitigation Commitment Summary example](#)  
[Acronym List](#)

#### **Applicable PRMS Codes:**

E00006

## **Activity Definition NEPA Follow-Up**

### **Receivables/Inputs:**

Completed NEPA document

### **Activity Description:**

The purpose of this task is to make sure that all WFLHD follows through on all commitments made during the NEPA process. This includes environmental support of the Construction Branch, such as permit maintenance and renewals.

Mitigation monitoring plans should be reviewed and monitored throughout the period of the plan, including revegetation plans and wetland monitoring plans. Yearly progress reports should be filed and distributed to appropriate agencies as required. In some cases, reimbursable agreements with other agencies can cover mitigation and monitoring requirements. These tasks may be completed by WFLHD environmental staff, or by a contractor or another agency under agreement.

### **Deliverables/Outputs:**

1. Mitigation monitoring
2. Revegetation monitoring
3. Wetland monitoring
4. Permit maintenance and renewals

### **Completion of Activity:**

At or after project completion, all environmental commitments have been fulfilled, and permits are closed out.

### **Additional Supporting Documentation:**

[PDDM Section 3 ENVIRONMENT](#)

Example mitigation monitoring plan

[Acronym List](#)

### **Applicable PRMS Codes:**

E0006

## **Activity Definition**

### **Sign-Off Review & Contract Preparation**

#### **Receivables/Inputs:**

Completed sign-off package and supporting documentation delivered to Acquisitions

#### **Activity Description:**

The purpose of this activity is to prepare a Contract for advertisement. The following tasks take place under this activity from the time the completed sign-off package is delivered to Acquisitions until the advertisement date:

##### Contract Liaison Engineer and Specifications Engineer

- Completes review of SCRs to ensure they are current
- Checks the [\*Design to PS&E checklist\*](#) to ensure sign-off package is complete
- Completes biddability review
- Revises the Engineer's Estimate (as needed) and prepares the bid schedule
- Prepares Federal Acquisition Regulation (FAR) clause notations

##### Contracts

- Prepares solicitation documents (FAR clauses, wage rates)
- Compiles review package
- Compiles distribution list with addresses

##### Pre-solicitation review

- Review by Project Development Engineer or Planning & Programs Manager
- Legal Review (for solicitations over \$500,000)
- Contracting Officer (CO) review
- 2<sup>nd</sup> level CO review (for solicitations over \$500,000)
- Director of Project Delivery review (only for Project Development solicitations)

##### Acquisitions

- Makes revisions after pre-solicitation review
- Orders printed plans
- Saves all documents to PDF format for website
- Requests printing of the solicitation package
- Requests printing of all physical data
- For all Montana projects, coordinates bid opening date with FHWA Division office in Helena

Allow 20 working days for this activity when preparing project schedules and determining the notice to proceed date ([PS&E to NTP Calculator](#)) for most projects. Additional time may be required for this activity depending on the number and timing of additional projects that have been delivered to Acquisitions.

**Completion of Activity:**

Acquisitions advertise the Contract.

**Additional Supporting Documentation:**

[PDDM Chapter 9.4.L](#)   [Contract Assembly](#)  
[Acronym List](#)

**Applicable PRMS Codes:**

C00004B  
C00005  
C&P004C  
C0006

## **Activity Definition Advertisement**

### **Receivables/Inputs:**

Contract under advertisement.

### **Activity Description:**

The purpose of this activity is to provide an opportunity for potential contractors to obtain information and prepare bids for advertised contracts. During this activity, Acquisitions responds to questions from potential Contractors and prepares amendments as necessary. They also distribute solicitation documents to WFL employees and agency representatives

Allow 30 calendar days for this activity when preparing project schedules and determining the notice to proceed date ([PS&E to NTP Calculator](#)).

Additional time may be required for this activity if:

- The 30<sup>th</sup> day lands on a Saturday, Sunday, Monday, or the first workday of the week when there is a holiday.
- It is a Montana project, which are opened in the Montana Division Office. Allow 35 days minimum for these bid openings.
- It is a complex project, which may lead to a delay in the bid opening. Amendments issued near the initial bid opening date may cause delays.
- Several projects are in Acquisitions at the same time.

### **Deliverables/Outputs:**

Not Applicable

### **Completion of Activity:**

Bids are opened.

### **Additional Supporting Documentation:**

[PDDM Chapter 9.4.L](#)   [Contract Assembly](#)  
[Acronym List](#)

### **Applicable PRMS Codes:**

C00008

## **Activity Definition Award**

### **Receivables/Inputs:**

The bids are opened.

### **Activity Description:**

The purpose of this task is to determine which bidder will be awarded the Contract. The following tasks take place under this activity from the time of the bid opening to award:

1. Acquisitions tasks:
  - Determines if HUBZone evaluation factor is applicable
  - Runs bid tabulation & obligation tabulation
  - Determines Responsiveness
  - Determines Contractor responsibility
  - For applicable Montana Projects, coordinates contractor completion of the MT-DEQ permit
  - If a subcontracting plan is required, coordinates Headquarters approval
  - Coordinates all bid protest submittals. In the case of a bid protest, award will be delayed by 60 days or more
2. If the low bid exceeds the obligated amount, Programming requests additional money. This may require Programming to coordinate funding w/client agency, which can take 6 weeks or more. This step may require the designer and CFT to complete a unit price analysis to determine if the bid prices are fair and reasonable.
3. For Negotiated Best Value contracts, the Designer, PM, and/or HDM may be required to assist in the negotiation process and provide support data for price discrepancies.

Allow 30 calendar days for this activity when preparing project schedules and determining the notice to proceed date for most projects ([PS&E to NTP Calculator](#)). Negotiated Best Value projects require substantially more than 30 calendar days for this activity for proposal reviews, discussions, and negotiations.

### **Deliverables/Outputs:**

Acquisitions provides documents for the PE Hold File.

### **Completion of Activity:**

The Contract is awarded.

**Additional Supporting Documentation:**

[PDDM Chapter 9.4.L](#)   [Contract Assembly](#)  
[Acronym List](#)

**Applicable PRMS Codes:**

C00008  
C00009



## **Activity Definition**

### **Design to Construction Handoff**

**Receivables/Inputs:**

1. Awarded project
2. Completed PE Hold file and staking data

**Activity Description:**

The purpose of this task is for Project Development to formally hand off CFT leadership to the Construction Branch, as per the [general CFT guidelines memorandum policy dated April 15, 2002](#). Information and leadership of the CFT is transferred from Project Development to Construction at a handoff meeting. This meeting may require anywhere from one hour of time to an entire day, depending on the complexity of the project. The meeting may be held in the office or in the field.

**Deliverables/Outputs:**

Established forum for CFT sharing of information with Construction. The PE and CFT review the project and the PE hold file. Detailed design data, project development details, and situations of note or potential concern are transferred to Construction at this forum.

**Completion of Activity:**

Completed review of the project and PE hold file information by the CFT, the PE/Construction Operations Engineer (COE), and Project Development. Leadership of the CFT is transferred from Project Development to Construction.

**Additional Supporting Documentation:**

[Construction Quality Assurance Process document](#)  
[Acronym List](#)

**Applicable PRMS Codes:**

None.

## Activity Definition

### Notice to Proceed

#### Receivables/Inputs:

1. Awarded contract
2. Acquisitions provides documents for the PE Hold File

#### Activity Description:

The purpose of this activity is to complete all required preconstruction activities prior the Notice to Proceed. **Note:** When preparing project schedules and determining the notice to proceed date for most projects, allow 21 calendar days from award of contract to Notice to Proceed ([PS&E to NTP Calculator](#)). The following tasks take place under this activity from the time of award to the Notice to Proceed date:

1. Acquisitions verifies bonds and insurance of selected Contractor and notifies Construction once bonds & insurance have been approved.
2. Upon receiving Plans/Specs from Acquisitions, Construction branch prepares NTP package that includes:
  - a. Preparing Delegation of Authority letter (Signed by Contract Development Engineer)
  - b. Letter from COE regarding preconstruction conference along with all paperwork that needs to be completed and submitted by the Contractor at the preconstruction conference or prior to beginning work.
3. COE/PE schedules precon and invites CFT members to attend.
4. COE/PE conducts the Preconstruction Conference.
5. The Contractor prepares documents that will enable them to start construction work (Construction schedule, safety plan, etc.)
6. The COE issues NTP

#### Deliverables/Outputs:

1. Bonds/Insurance verified
2. Preconstruction Conference, Agenda, Minutes

#### Completion of Activity:

The Notice to Proceed is issued.

#### Additional Supporting Documentation:

[PDDM Chapter 9.4.L](#)   [Contract Assembly](#)  
[Acronym List](#)

#### Applicable PRMS Codes:

C00010

## **Activity Definition**

### **Mid-Construction Review**

**Receivables/Inputs:**

Approximate mid-point of construction project.

**Activity Description:**

The Mid-Construction review is an optional activity requested by the Construction Branch.

The purposes of this activity are 1) to perform an in-depth review of design, administration and contractor construction methods, and how they relate to the plans, specifications and intent of the project; and 2) to identify items that require improvement (Lessons Learned) and items that may be highlighted (Best Practices). The CFT has responsibility for this review. Required reviewers are the Lead Designer, PE/COE, Environmental Specialist, and the CQAS, although all members of the CFT may be included. The CQAS will coordinate the review, which may occur over a one or two-day period as needed. Construction contractor personnel may be invited to attend and contribute.

**Deliverables/Outputs:**

CFT Mid-Construction Report, listing “Lessons Learned”, “Best Practices” and other ideas for improvement.

**Completion of Activity:**

The CQAS completes the CFT Mid-Construction Report, and the CFT transfers administration of follow-up activities to the WFLPII team.

**Additional Supporting Documentation:**

[Construction Quality Assurance Process document](#)  
[Acronym List](#)

**Applicable PRMS Codes:**

Not Applicable

## **Activity Definition**

### **Post-Construction Review**

#### **Receivables/Inputs:**

Approximate completion point of construction project.

#### **Activity Description:**

The Post-Construction review is an optional activity requested by the Construction Branch.

The purposes of this activity are 1) to perform an in-depth review of design, administration and contractor construction methods, and how they relate to the plans, specifications and intent of the project; and 2) to identify items that require improvement (Lessons Learned) and items that may be highlighted (Best Practices). The CFT has responsibility for this review. Required reviewers are the Lead Designer, PE/COE, Environmental Specialist, and the CQAS, although all members of the CFT may be included. The CQAS will coordinate the review, which may occur over a one or two-day period as needed. Construction contractor personnel may be invited to attend and contribute.

#### **Deliverables/Outputs:**

CFT Post-Construction Report, listing “Lessons Learned”, “Best Practices” and other ideas for improvement.

#### **Completion of Activity:**

The CQAS completes the CFT Post-Construction Report, and the CFT transfers administration of follow-up activities to WFLPII team.

#### **Additional Supporting Documentation:**

[Construction Quality Assurance Process document.](#)  
[Acronym List](#)

#### **Applicable PRMS Codes:**

Not Applicable

# PROJECT AGREEMENT

*United States Department of the Interior / National Park Service*



## GLACIER NATIONAL PARK

# Going-to-the-Sun Road Wall Repair Ph. V

**Package Number: GLAC 54273**

**FLHP Project Number: MT PRA-GLAC 10(20)**

**Funding: \$3.2 Million**

**Revised July 2004**

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This is an agreement among three parties: Glacier National Park, the Intermountain Region, and FHWA/Western Federal Lands Highway Division. It describes specific project requirements to be fulfilled and duties to be performed by all parties to produce or supply the services and products as described below.

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### AGREED:

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Superintendent, Glacier National Park

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Date

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Chief, Project Management Division, Glacier National Park

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Date

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Project Manager (NPS Projects), Western Federal Lands Division, FHWA

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Date

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FLHP Coordinator, Intermountain Region, NPS

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Date

## PROJECT LOCATION

Within Glacier National Park in Montana, the 49-mile Going-to-the-Sun Road (GTSR) is the only access through the park, connecting the park's west entrance at West Glacier, crossing the continental divide to the east entrance at St. Mary. It also provides the only access to the Logan Pass area, which is the primary destination point within the park. The GTSR was constructed between 1922 and 1937, and was designated a National Historic Landmark in 1997. Of the many features contributing to the landmark status are the approximately 129 historic stone masonry retaining walls that provide structural support for the road in many areas, to provide necessary width for the road itself.

## PROJECT PURPOSE AND BACKGROUND

Beginning in 1994 the Federal Highway Administration (FHWA) has assessed the condition of the stone masonry retaining walls, and has identified and prioritized the wall repair needs. The Wall Management Plan provides for an annual update of the condition of the retaining walls. Repair needs have been defined as 1) walls with a high priority for major structural repairs due to safety concerns, 2) walls needing substantial structural repairs, and 3) walls needing grout repointing to retard degradation. In addition to FHWA assessments, an independent engineering study conducted by Washington Infrastructure consultants identified a variety of drainage improvements that are very important for correction. Other issues identified by FHWA and Washington include improving safety hazards posed by damaged or under-height guardwall, maintaining the cultural integrity of the historic fabric composing this National Landmark feature, and improving slope stability problems. Another serious problem along GTSR is damage due to seasonal avalanches. Two experimental treatments have been and are being pursued to minimize avalanche damage. Avalanche resistant guardwall has been designed and installed at two locations and are currently being monitored. First-season information is very promising. Also, removable guardrail in avalanche chutes are being designed and crash tested currently (funded through CTIP) to address avalanche problems.

The purpose of the proposed project is to provide structural repairs and drainage rehabilitation to the high priority retaining walls identified in the wall management plan, drainage improvements at non-wall sites, improve safety conditions and historic fabric through guardwall improvements, and implement removable guardrail to evaluate efficacy for avalanche conditions. The following will prioritize sites which most effectively obtain the above objectives.

## PROJECT SCOPE

At all repair locations, final grade for paving will be set. For any work involving historic fabric, cultural integrity will be maintained. At all repair sites, drainage deficiencies will be corrected. All repairs will be performed according to traffic control requirements set forth in the selected alternative of the GTSR EIS. An additional element of this project is to identify potential sources for appropriate stone materials. The park prefers to use competitive negotiations ("Best Value" contracting) instead of low bid. The schedule below allows sufficient time for this type of procurement assuming favorable timing of reauthorization. One of the primary goals for Best Value contracting is to try to accomplish a substantial amount of work (this project) in one construction season.

**1. Repair the pedestrian portals and stabilize the rock above the up hill traffic portal on the West Tunnel.** Grout holding the stone veneer has deteriorated to sand. Stones are falling routinely into the travel way and two pedestrian viewing areas. This is the highest safety priority presently identified on GTSR. Repair for the pedestrian portals is to apply colored, fiber-reinforced shotcrete to the stone ceiling. Interim repair for the traffic portal is rock scaling and bolting on the rock above the traffic portal. Long term repair is to "extend" the portal as was done to the downhill portal.

**2. Repair drainage and roadside deficiencies at Oberlin Bend.** Undersized drainage structures frequently overflow during spring runoff and have caused considerable damage and a dropoff along the road edge. Hydraulic analysis will be performed to help identify repair strategies.

**3. Rebuild the side slopes, stone masonry guardwall and roadway east of Logan Pass.** This will probably require construction of a natural stone retention structure in an effort to stabilize the side slopes and look as natural as possible. This work will also include rebuilding the stone masonry guardwall with a reinforced concrete retaining wall and reconstructing the roadway to design standards in order to improve safety and protect the roadway structural integrity.

**4. M.P. 27.58 Guardrail Construction.** Construction guardwall above drainage structure adjacent micropiled slab and 27.58 to protect public travel.

**5. M.P. 30.65 Wall Repair.** Repair the foundation of the stone masonry retaining wall at this location.

## PROJECT SCHEDULE

The following schedule reflects a FY 2005 contract award revised to \$3.1M. This depends on “NextTea” funding. If funding does not increase, the schedule will be redone to reflect a different award schedule.

<u>TASK</u>	<u>Completion Date</u>	<u>Responsible Office</u>
Survey and Mapping	July 2003	FHWA
Geotechnical Investigations	July 2003	FHWA
30% design	November 2003	FHWA/GLAC
Value Analysis	December 2003	FHWA
GTSR ROD	June 2003	GLAC
DAB	December 2003	GLAC
Review 70% PS&E (PIH)	July 2004	FHWA/GLAC
Review 95% PS&E	August 2004	FHWA/GLAC
Final NPS Approval	August 2004	GLAC
Detailed Budget	September 2004	FHWA
Advertise Contract when funding is available	September 2004	FHWA
Award Contract	December 2004	FHWA
Begin Construction	May 2005	FHWA
End Construction	November 2005	FHWA

## ROLES AND RESPONSIBILITIES

**NPS - Glacier National Park** - The Glacier National Park Superintendent will provide overall project direction and park administration for the project. The park Project Manager will serve as the primary point of contact for the project, and will coordinate park reviews of documents, and attend design and construction status meetings. The Superintendent shall approve plans and specifications based upon professional recommendations by the park staff and FHWA.

GLAC will complete the EIS/ROD for GTSR. WFLHD will review and adopt the compliance document.

Design Advisory Board (DAB) – GLAC shall prepare a DAB report, schedule a presentation to the DAB, and make the DAB presentation.

During construction, GLAC shall be responsible for visitor inquiries and taking appropriate measures to inform visitors of delays caused by the road construction. GLAC shall also take the lead to answer concerns or complaints arising from the road construction. Reference the GLAC construction roles and responsibilities document for additional detail.

Request for changes in the scope of work, project agreement, or to change designs once they are approved, shall be signed or requested by the Superintendent.

**NPS – Region:**

The FLHP Coordinator will confirm funding and funding schedules. The FLHP Coordinator will also confirm project scope and compliance with programmatic requirements. Participate in field reviews as needed.

**FHWA, WFLHD:**

WFLHD is responsible for providing engineering recommendations and design and construction administration services. WFLHD shall complete final plans, specifications, and estimates (PS&E) for construction of the project. The WFLHD Design Operations Engineer (DOE) will provide general project leadership, NPS and internal WFLHD project coordination, and serve as the primary point of contact in WFLHD during project development. The DOE is responsible for coordinating all WFLHD work, managing the budget, addressing any proposed changes in scope, and verifying adherence to environmental documents.

The WFLHD Construction Operations Engineer (COE) will provide constructability review, and construction management. During construction, WFLHD shall provide necessary construction management, inspection, and material testing necessary for proper completion and enforcement of the construction contract. WFLHD shall also provide contract administration to adequately award and administer the contract, including negotiation of contract modifications, processing contractors payments, and settlement of claims. If additional funding is required for change orders, WFLHD shall jointly support such funding, and pursue funding request with the NPS.

All permitting requirements are the responsibility of WFLHD.

ACTIVITY	ORGANIZATION	INDIVIDUAL/PHONE
Compliance NEPA Archeology Tribal Consultation Adoption	GLAC  FHWA	John Kilpatrick 406-888-7977  Steve Zaske 360-619-7723
Project Coordination Project Management Project Agreement Detailed Project Budget	GLAC FHWA	John Kilpatrick 406-888-7977 Betty Chon 360-619-7815
Project Schedule Project Funding	GLAC/FHWA IMR	Kilpatrick/Dick Gatten Dave Keough 360-619-7764
Project Development Design  Stone Source Plan External Internal Communications Plan Landscape/Cultural Revegetation Value Analysis DAB Permitting	FHWA  FHWA/GLAC  GLAC GLAC GLAC FHWA GLAC FHWA	Randy Square-Briggs 360-619-7894  Margaret Moen 406-892-4886 Jack Gordon 406-888-7973 Gordon/Vanderbilt Jack Gordon 406-888-7973 Joyce Lapp 406-888-7817 Dick Gatten 360-619-7729 John Kilpatrick Steve Zaske
Construction Admin. Park Acceptance	FHWA GLAC	Howe Crockett 360-619-7750 John Kilpatrick
Points of Contact Park WFLHD  Region		Kilpatrick 406-888-7977 Chon 360-619-7815 Crockett 360-619-7750 Keough 360-619-7764



## **COMMUNICATION BETWEEN GLAC/IMR/FHWA**

Three-way communications between GLAC, WFLHD, and the Intermountain Region shall be utilized when feasible and shall depend on the availability of all parties. When two parties discuss project scope, cost, team composition, schedule, travel, and similar topics, they shall notify the other party by phone or e-mail as needed. Communications will generally not be delayed because of the unavailability of any one party. To ensure consensus on key issues or project changes, all three parties shall attempt to communicate simultaneously via conference call or meeting. Conference calls will occur on roughly a bi-weekly basis.

## **PROJECT BUDGET**

A detailed project budget will be developed according to the schedule.

## **PROJECT AGREEMENT AMENDMENT PROCESS**

The project agreement may be amended by any party of the agreement, subject to the concurrence by all original signatories. Circumstances that may result in an amendment to this agreement include major changes in scope, schedule, products, and budgets. Amendments shall be in the form of revisions to the original project agreement, or they shall be documented through standard correspondence or electronic mail. Amendments shall be distributed to all signatories of the original agreement. All proposed amendments shall be decided in a timely manner and within 10 working days from the receipt of the written proposal.

A simple amendment to this PA (e.g. change in schedule) shall be developed informally and documented by e-mail from the party desiring the amendment with agreement from the IMR FLHP Coordinator and sent to all participating team members.

The scope of the project is to continue with Phases III and IV of the stabilization effort addressing the remaining high priority structural stone retaining wall repair needs and improve drainage conditions. The major repairs will address damaged wall reconstruction needs, settlement behind walls, top of wall or guardwall replacement, drainage problems, foundation support deficiencies, and grout damage. The project will reduce the safety concerns at these high priority locations, and will give stability and increased wall life as a functional element of the historic GTSR. Repairs will also be conducted at sites in addition to the highest priority structural wall repair sites.

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# Project Identification Report Process

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Western Federal Lands Highway Division

September 30, 2003

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## **LIST OF ACRONYMS**

<b>FH</b>	<b>Forest Highway</b>
<b>FHWA</b>	<b>Federal Highway Administration</b>
<b>FS</b>	<b>Forest Service</b>
<b>NEPA</b>	<b>National Environmental Policy Act</b>
<b>PRMS</b>	<b>Program and Resource Management System</b>
<b>PS&amp;E</b>	<b>Plans, Specifications and Estimates</b>
<b>ROW</b>	<b>Right-of-Way</b>
<b>SOW</b>	<b>Scope-of-Work</b>
<b>TIP</b>	<b>Transportation Improvement Plan</b>

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# **I. BACKGROUND**

This document summarizes the results of a process review conducted by the Western Federal Lands Highway Division (WFLHD) during FY 2002. A team reviewed WFLHD's Project Identification Report (PIR) process, which was developed and documented in 1997. The intent of the review was to streamline and improve the PIR process by incorporating the lessons learned during the last five years.

The PIR process is designed to provide the information necessary to determine whether a project should be initially placed on the program. The process provides a sound basis for commitment of resources necessary to conduct environmental studies and other activities with respect to the proposed project. The PIR process is not the final determination on which projects are designed and built. That determination is made only after a thorough analysis of all relevant factors, including NEPA review. Whether the project is actually funded and built, the extent of the project, and the type of project chosen to meet the purpose and need will be determined only after the NEPA process is completed.

The PIR process outlined in this report applies primarily to the Forest Highway Program. The recommendations focus on better project identification before the programming stage. The document describes a project identification report process that begins after project proposals have been ranked and rated by the program agencies. The process ends when the project is placed on an approved program for funding. The document describes each step of the project identification report process in more detail, and provides examples in the appendices.

## II. PROJECT SELECTION AND PROGRAMMING PROCESS

The initial project selection and programming process is described below.

1. The program agencies, FHWA, Forest Service (FS) and DOT, issue a call for new projects for the program. The sponsoring agencies (typically agencies at the local level that have direct responsibility for land management, maintenance, and jurisdiction) jointly prepare a **Project Proposal** and submit it to the program agencies. A project proposal form is shown in Appendix A.
2. The program agencies, FHWA, FS and DOT, evaluate **Project Proposals** by using a matrix evaluation or Choosing By Advantage process.
3. An initial screening is performed based on available program funding. A list of projects to be considered is developed. Project Identification field reviews are scheduled to gather information for the PIR.
4. The Forest Highway Program Coordinator selects PIR team; gathers preliminary data; arranges for the on-site meeting; and determines who will attend the meeting. The PIR team members may or may not represent the Cross Functional Team (CFT) utilized during Project Delivery. This is the first step in the PIR process.
5. The Forest Highway Program Coordinator prepares the **Project Identification Report** and Executive Summary for the projects reviewed, and after review and agreement by the Project Manager, the reports are sent to the program agencies.
6. The program agencies take an official program action. (i.e., put project on the program; drop the proposal, or request more information).
7. If the project is placed on the approved program, the Forest Highway Program Coordinator prepares a project agreement with the agencies having jurisdiction of the project.
8. The Forest Highway Program Coordinator enters basic information for the project into the Program and Resource Management System (PRMS) after the project is officially programmed. (Title, initial programming estimate, delivery year.)
9. The Forest Highway Program Coordinator forwards project to Project Delivery. Copies of the PIR, and the project agreement are forwarded to the responsible Project Manager.

### **III. PROJECT IDENTIFICATION REPORT PROCESS**

The PIR process begins after the project proposals have been rated and ranked by the program agencies. Based on projected available funding, the highest ranked projects are selected for field review. The PIR process ends when the project is placed on an approved program for proposed funding. The PIR process is described below.

1. The Forest Highway Program Coordinator forms the PIR team and ensures that representatives from all needed disciplines are included. This team may be comprised of in-house staff, consultant staff, or a combination of the two. PIR team responsibilities are identified in Appendix B.
2. The Forest Highway Program Coordinator notifies the team of proposed field review dates.
3. The Forest Highway Program Coordinator requests additional documentation from partner agencies and completes the Fact Sheet for the PIR team. The Fact Sheet contains a description of the project, the identification of partners, reasons for the project including the purpose and need, a description of the existing highway conditions, traffic and safety data and the project proposal with a location map.
4. The Forest Highway Program Coordinator schedules the kick-off team meeting. This meeting can be in the office or field. Team will review the purpose and need, project documentation, and project proposal submitted by Program/Planning. The team will discuss team responsibilities, project objectives and possible alternative strategies to be considered during the field review.
5. The team conducts a field review. The field review will include partner agencies.
6. The Forest Highway Program Coordinator schedules and facilitates the closing team meeting. The purpose of the meeting is to clearly define purpose and need, project objectives, and alternatives considered in the final PIR report. The team agrees to a PIR completion schedule.
7. Each team member forwards individual sections to the Forest Highway Program Coordinator for incorporation into PIR document.

## IV. PROJECT IDENTIFICATION FIELD REVIEW

The field review is a critical step in the **Project Identification** process. The Program Coordinator and a PIR Team meet with the project sponsors and other interested agencies on-site to observe conditions and confirm project expectations/concerns of the participants. The PIR Team may consist of technical staff from Hydraulics, Structures, Geotech, Right of Way (ROW)/Utilities, Construction, Design, Safety, and Environment.

The following information is obtained before or during the field review:

1. Existing data, such as as-built plans, current traffic data, and current accident data.
2. An inventory of the physical features of the existing road. An inventory by milepost which includes existing road widths, signing, guardrail, roadside features, drainage problems, geotechnical problems, etc. A sample Road Inventory Listing is contained in Appendix C.
3. Project deficiencies, including assessment of operational speeds, safety problems, alignment deficiencies, operational problems, utilities in the road corridor/obvious conflicts, private property along the road corridor/conflicts, land use, etc.
4. Verification of the purpose and need of the project with the "hands on" agencies, including a determination of the project sponsor's constraints, issues, existing maintenance problems, and project embellishments, such as parking areas, trailheads, etc. A critical focus of the **Project Identification field review** is to verify the purpose and need for the project as proposed.
5. Conceptualization of a range of possible alternative strategies that could satisfy the identified deficiencies and purpose and need. This is not an all-inclusive list and is used for the purpose of programming a project. A complete list of all reasonable alternatives will be identified in the NEPA process.
6. Identify environmental issues such as habitat areas for listed species, cultural resources, and partner agency contacts for resource information.
7. Identification of preliminary engineering needs, including any abnormal PE costs, for (1) Survey and Mapping, (2) Right-of-Way and Utilities, (3) Geotechnical, (4) Environmental, (5) Hydraulic, and (6) Structural, etc.
8. Identification of partner agency contributions/agreements needed.

**It is not the intent to require detailed investigations at this point in the process, but only to report the information learned from visual observations during the field review, existing data, and discussions with the local agencies. Detailed investigations will occur after the project is programmed during the normal project development process.**



## V. PROJECT IDENTIFICATION REPORT

The Project Identification Report is an engineering report whose purpose is to establish a proposed project scope, schedule, and estimated cost of a project so that the project can be considered for inclusion in a future Forest Highway Program. The report shall use an Executive Summary to outline the proposed project scope, schedule and budget. All other data shall be attached as appendices.

The **Project Identification Report** will contain:

1. Executive Summary
2. Project Proposal
3. Purpose and Need Appendix
4. Design/Safety Appendix
5. Environmental Appendix
6. Geotech Appendix
7. ROW/Utilities Appendix
8. Hydraulics Appendix
9. Structures Appendix
10. Construction Appendix
11. Map
12. Contacts

# APPENDIX A

## Project Proposal Form

(April 5, 2002)

## MONTANA FOREST HIGHWAY PROGRAM PROJECT PROPOSAL FORM

*Attach a vicinity map (USGS or larger scale) showing the project's location and termini. Also, indicate on an attached map the extent of National Forest System lands served by the proposed project. Attach additional pages if necessary to provide thorough responses to the questions.*

### Project Identification:

FH Route No.:

Forest Highway Inventory Name:

Local Route Name:

Project Name (if any):

Agency with Current Jurisdiction (consider road ownership, operation, law enforcement):

Sponsor (Entity with authority to finance, build, operate or maintain a public highway. The sponsor will maintain the proposed project: \_\_\_\_\_)

Agency currently maintaining the Roadway:

Functional Classification (Select one based on Federal Highway Administration classification for highways):

- ☐ Arterial
- ☐ Major Collector
- ☐ Minor Collector
- ☐ Local Road

Is this project on a State route?

Yes    No  
☐    ☐

Termini (Reference points, landmarks):

Beginning: \_\_\_\_\_ Ending: \_\_\_\_\_

Project length \_\_\_\_\_ km

Current Average Daily Traffic (ADT is the average number of vehicles passing a point during the day):

\_\_\_\_\_ with \_\_\_\_\_% trucks from ☐ official count ☐ estimate

with \_\_\_\_\_% traffic with origin or destination on National Forest System Land

Forecasted Future Average Daily Traffic: \_\_\_\_\_ in the year \_\_\_\_\_

Structures on National Bridge Inventory (NBI):

NBI Str. # \_\_\_\_\_, Length \_\_\_\_\_, Width \_\_\_\_\_, NBI Sufficiency Rating (1-100) \_\_\_\_\_

NBI Str. # \_\_\_\_\_, Length \_\_\_\_\_, Width \_\_\_\_\_, NBI Sufficiency Rating (1-100) \_\_\_\_\_

NBI Str. # \_\_\_\_\_, Length \_\_\_\_\_, Width \_\_\_\_\_, NBI Sufficiency Rating (1-100) \_\_\_\_\_

NBI Str. # \_\_\_\_\_, Length \_\_\_\_\_, Width \_\_\_\_\_, NBI Sufficiency Rating (1-100) \_\_\_\_\_

**Existing Road and Deficiencies** (Describe existing road conditions and physical deficiencies e.g. surfacing, width, alignment, safety hazards):

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**Description of proposed work** (Include details such as roadway width, surface type, approximate design speed, and structures, proposed roadside improvements, and removal of safety hazards.):

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**Right-of-way acquisition** (Classify ROW required for described project.):

Extensive    Minor    None

Right-of-way acquisition is the responsibility of the sponsor. Anticipated time to acquire ROW:

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Estimated cost of ROW: \$\_\_\_\_\_

**Utilities** (Identify utilities in the roadway corridor. Is relocation needed?).

\_\_\_\_\_ Estimated cost for Utilities: \$\_\_\_\_\_

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**Describe any environmental issues associated with project** (Such as wetlands, live streams, Wild & Scenic Rivers or other special classifications, historic and archaeological sites, parks, wildlife refuges, recreation areas, hazardous materials sites, include threatened, endangered, or sensitive species, such as bull-trout, wolf, grizzly, lynx etc.):

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Describe the range of attitudes, both support and opposition, that this proposed project may receive from organizations and the public (Also include coordination efforts completed to date. Coordination between FS/State/Communities is highly encouraged.):

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Category of proposed work :

**Construction/Reconstruction** (Typically includes major changes in roadway geometrics, horizontal/vertical alignment, grade, and/or width. Proposed work requires additional ROW.)

**Rehabilitation, Overlay, or Pavement Recycling** (Rehabilitation typically includes only minor changes in alignment, grade and width. Overlay, recycling, typically includes some subgrade repair, but little earthwork or roadside work. Proposed work occurs within the existing ROW.)

**Construction cost estimate:**

\_\_\_\_\_ mi. (km) of Construction/Reconstruction @ \$ \_\_\_\_\_ per mi.(km) =\$ \_\_\_\_\_  
\_\_\_\_\_ mi. (km) of Rehabilitation/Surfacing @ \$ \_\_\_\_\_ per mi.(km) =\$ \_\_\_\_\_  
\_\_\_\_\_ ft. (m) of Bridge work =\$ \_\_\_\_\_  
Other work: \_\_\_\_\_ =\$ \_\_\_\_\_  
\_\_\_\_\_ =\$ \_\_\_\_\_

**Estimated Total Cost of Proposed Project** =\$ \_\_\_\_\_  
(Construction Cost Only)

**Cost Estimate Basis (Select One):**

Detailed \_\_\_\_\_ (Engineering Completed. Completed design.)

Preliminary \_\_\_\_\_ (Some Engineering Complete. Limited analysis.)

Rough \_\_\_\_\_ (No Engineering Complete. Estimate based on average cost per mile or kilometer.)

Proposed State/Local Contribution to Project (Cost share, commitment to build adjacent project, project development activities, etc.):

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**How does the project relate to the following Forest Highway criteria?** Questions are provided as a guide.

*For Construction/Reconstruction projects address all criteria.*

*For Rehabilitation, overlay, or re-cycle projects, omit criteria #1, #3a and #3b.*

**1. Development and utilization of the National Forest System and its renewable resources.**

How does this project change the access and/or utilization of the National Forest System? What resources will people utilize if the project is implemented? How does the proposed project contribute to the use of renewable resources of the National Forest? Provide specific examples, e.g. how will the project develop recreational opportunities? What effects are expected from these changes in access and utilization? Who will be affected?

This project provides access to \_\_\_\_\_ acres of National Forest?

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**2. Enhancement of economic development at the local, regional and national level.**

**Note:** Direct effects of implementing the project, i.e. construction employment will not be scored.

How will this project support new, permanent economic opportunities such as mining, timber, agriculture, or recreation? Identify the type of opportunities. Also describe the scope of the economic development benefits. How will the proposed improvement contribute to local, regional, or national benefits? How many board feet of timber are transported over this road?

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**3a. Continuity of the transportation network serving the National Forest System.**

How will the proposed project improve the continuity of the transportation network? Which gaps or missing links will the proposed project address? What other practical routes or alternatives are available? What work has been completed on adjacent sections to create the route continuity envisioned? What additional work/changes will be needed to create the route continuity that is envisioned? How does this proposal fit with the Forest Plan?

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**3b. Continuity of the transportation network serving communities, which are economically dependent upon the network.**

Identify the community or communities economically dependent on the network, and the elements that comprise that economy (e.g. timber, tourism, etc.). How is the economy tied to the transportation network? How will the proposed project provide continuity to the transportation network and support the community's economic goals/needs, county comprehensive plan, or other economic plan? How will the proposed project improve the continuity of the transportation network? Which gaps or missing links will the proposed project address?

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**4. Mobility of users of the transportation network and goods and services provided.**

Who are the users of this transportation network? What goods and services are transported along this segment of the network? How will the improvement make access easier and facilitate travel (e.g. comfort, convenience, travel time)?

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**5a. Improvement of transportation network for economy of operation and maintenance.**

How will this project affect maintenance and operation cost of the existing transportation network? Is winter maintenance provided? What is the \$/year cost of maintaining and operating the existing facility? What is the anticipated cost of maintenance and operation of proposed facility? Include Pavement management system information if available.

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**5b. Improvement of user safety.**

Identify features that are safety hazards. Include an engineering safety analysis, if available. Also include information such as accident data, reported incidents, and anecdotal information.

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**6. Protection and enhancement of rural environment associated with the National Forest System and its renewable resources.**

How does this project contribute to the goals and objectives of the Forest Plan? What environmental impacts will the proposed project have? How does the proposed project protect or enhance the physical, biological, and social components of the National Forest System and rural communities? How does the project improve water quality, air quality, animal habitat?

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**Other remarks:**

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**CONTACT PERSON FOR TECHNICAL QUESTIONS:**

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(NAME)

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(ORGANIZATION)

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(PHONE No.)

**Submitted by:**

\_\_\_\_\_  
(Sponsor)

\_\_\_\_\_  
(National Forest)

By: \_\_\_\_\_  
(Name)

By: \_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Date)

Telephone: (\_\_\_\_\_) \_\_\_\_\_

Telephone: (\_\_\_\_\_) \_\_\_\_\_

FAX: (\_\_\_\_\_) \_\_\_\_\_

FAX: (\_\_\_\_\_) \_\_\_\_\_

**Coordination between agencies is encouraged. Letters of support maybe included. Send three (3) complete copies of this project packet (proposal form and maps) to:**

**FHWA: Pete Field, FHWA, 610 East Fifth Street, Vancouver, WA 98661**

**QUESTIONS?** Contact Fred Bower, FS, (406) 329-3354, Gary Larson, MDT (406) 444-6110, or Pete Field at (360) 619-7619.

# APPENDIX B

## PIR Responsibilities

**Planning**

- Purpose and Need (Pre-PIR development)
- Project Proposal

**Programming**

- Forms PIR Team
- Executive Summary
- Pre-PIR Data Collection and Fact Sheet
- Purpose & Need
- Project Objectives (Input to Environment)
- **Project Contacts**

**Environment**

- Environmental Appendix
- Project Objectives

**Geotechnical**

- Geotechnical Appendix
- Programming Estimate (Input to Design)

**Hydraulics**

- Hydraulics / Hydrology Appendix
- Programming Estimate (Input to Design)

**Design**

- Design Appendix
- Programming Estimate
- Traffic Analysis
- Road Log (Existing Conditions Narrative)
- Alternatives Considered
- Map

**PM**

- Project Schedule
- PIR Meeting Minutes
- Project Objectives
- Alternative Strategies

**Structures**

- Structures Appendix
- Programming Estimate (Input to Design)

**Construction**

- Programming Estimate (Input to Design)

**ROW / Utilities**

- ROW / Utilities Appendix
- Programming Estimate (Cost and Schedule)

# APPENDIX C

## Example Road Inventory Listing

## BEARTOOTH HIGHWAY SEPTEMBER 6 TO 8, 1993 MONTANA FOREST HIGHWAY 59

NOTE: The following Road Inventory Listing was developed from a field inspection by LANGLITZ, EMERSON, FEKARIS, COOK, & HYNDMAN during the above dates. Notes in italics were from comments made during a tour of the route with local FS and NPS participants on September 8, 1993.

ROAD INVENTORY LISTING MP 0.00 TO MP 4.31 FIELD REVIEWED BY LANGLITZ ON 9/6/93.		
ODOMETER	MILE POST	DESCRIPTION
0.00	-0.39	NE ENTRANCE STATION. PAVEMENT WIDTH = 23'. ABOUT 7' FROM EP TO DITCH. NO SHOULDER STRIPE. DOUBLE SOLID YELLOW CENTERLINE. NO DELINEATORS
0.05	-0.34	SIGN RIGHT: US ROUTE 212 MARKER
0.20	-0.19	PAVEMENT WIDTH = 22' MINIMAL GRAVEL SHOULDER
0.39	0.00	SIGN LEFT: YNP ENTRANCE SIGN. NPS BOUNDARY. This area needs to be developed as an interpretive area, and it should include a Fire Board. The wilderness boundary is 45 feet right of the road at this point
0.40	0.01	SIGN RIGHT: FS FIRE DANGER.
		DENSE LODGEPOLE FOREST NEXT TO THE ROAD. AVERAGE 6" TO 1' IN DIAMETER. NICE GRASS UNDERSTORY RIGHT UP TO THE EDGE PAVEMENT. SHALLOW CUTS AND FILLS.
0.52	0.13	30" CULVERT. SOME MATERIAL SLOUGHING DOWN INLET. Spring run off over tops the culvert and comes across the top of the snow. This drainage is running water now, which is unusual. It is usually dry by mid July.
0.53	0.14	SIGN RIGHT: BEARTOOTH SCENIC BYWAY
0.60	0.21	SIGN RIGHT: SILVER GATE - ELEVATION 7388. FOUNDED 1932. 50' DIRT PULLOUT IN FRONT OF SIGN. PHOTOS J3.20 BACK AND J-3.21 AHEAD.
0.70	0.31	SIGN RIGHT: 25 MPH SPEED LIMIT.
0.72	0.33	TELEPHONE PEDESTAL IN LEFT DITCHLINE. CREEK ALONG TOE OF FILL RIGHT - 20' HIGH. 15' CUT LEFT Soda Creek parallels the road the road at this point. This creek is very sensitive, and filling into the creek should not be considered
0.80	0.41	APPROACH ROAD RIGHT. APPEARS TO BE THE BEGINNING OF PRIVATE PROPERTY. TELEPHONE PEDESTALS LEFT AND RIGHT. OVERHEAD POWER CROSSING -2 WIRE.
0.81	0.42	DRIVEWAYS LEFT AND RIGHT. BUCK AND POLE FENCE 5' OFF RIGHT EDGE OF PAVEMENT. Drainage from the left approach road is a problem during spring runoff. Debris can block a whole lane of the road.
0.90	0.51	SIGN RIGHT: SILVER GATE (GREEN AND WHITE). END BUCK AND POLE FENCE. CREEK AGAINST RIGHT TOE OF FILL
0.95	0.56	BEGIN ROADSIDE BUSINESSES. WIDE DIRT PARKING STRIPS BOTH SIDES. PHOTOS J-3.22, G-1.16, G-1.17, & G 1.18 AHEAD. STORM DRAIN SYSTEM LEFT. GAS AVAILABLE LEFT. OVERHEAD POWER LINES. The building on the left is historic. Soda Creek is close to the road directly across from the building. There is only one drop inlet for the storm drain system. Plowing snow on the gravel parking areas is difficult because of potholes. However, if the area is paved, then storm drainage will have to be taken into consideration. There are underground gas tanks on the right.

	0.60±	Waterlines cross under the road at this location about 2.5 to 3 feet deep. Freezing is a problem. There is a wire with the pipes for
1.09	0.70	PHOTOS J-4.1 BACK, J-4.2 AHEAD, AND J-4.3 BACK. END WIDE DIRT PARKING STRIPS BOTH SIDES. BEGIN WETLAND RIGHT. SHORT SECTION OF WETLAND LEFT ALSO. The County will not allow the private owner to develop the wetland area at this location. This is a possible moose viewing area.
1.15	0.76	BEGIN WETLAND RIGHT. SHORT SECTION OF WETLAND LEFT ALSO. The county will not allow the private owner to develop the wetland area at this location. This is a possible moose viewing area.
1.30	0.91	SIGN LEFT: SPEED LIMIT 25 MPH. HIGHER CUT LEFT WITH STAIRS UP TO RESIDENCES. CANNOT WIDEN TO THE LEFT. BEGIN ELECTRIC WIRE FENCE RIGHT
1.39	1.00	MILEPOST MARKER 1 RIGHT. POWER LINE CROSSING ROAD -2 WIRE. END WETLAND RIGHT.
1.39	1.00	SEVERELY DISTRESSED AREA TO ODOMETER 1.55 - FROST HEAVE. GARAGE ABOUT 20' FROM EDGE TELEPHONE PEDESTAL LEFT. LEFT
1.59	1.20	GARAGE ABOUT 20' FROM EDGE OF RIGHT PAVEMENT. TELEPHONE PEDESTAL LEFT. DRAINAGE PROBLEM LEFT
1.63	1.24	DRAINAGE PROBLEM 72" PIPE. INLET AND OUTLET HAVE BEEN RECENTLY GRADED TO REMOVE MATERIAL MOVING THROUGH THIS PIPE. NOT A LIVE STREAM PIPE: SHOWS RUST. PAVEMENT WIDTH = 22'. This major drainage has to be dug out every year. Debris is not a problem, just gravel and sediment moving down the drainage. This is a braided stream on an alluvial fan. There is a 30" culvert just ahead for this same drainage.
1.75	1.36	DRAINAGE PROBLEM. 30" CULVERT. LIVE STREAM MATERIAL SLOUGHING INTO THE INLET. Spring runoff problem. The culvert backs up with sediment and snow, and water then runs down the road to the next culvert.
1.80	1.41	NEW RESIDENCE RIGHT, FAIRLY CLOSE TO THE ROAD.
2.00	1.61	ROAD RUTTED DOWN CENTERLINE
2.08	1.69	BEGIN BUCK AND POLE FENCE LEFT.
2.11		END BUCK AND POLE FENCE LEFT. OVERHEAD POWER LINE TWO WIRE. TELEPHONE PEDESTALS LEFT AND RIGHT
2.21	1.82	MINOR DRAINAGE SWALE.
2.23	1.84	RELATIVELY NEW GRADED PULLOUT RIGHT, ABOUT 100' LONG. WETLAND TO THE RIGHT OF THE PULLOUT. All of the material for the pullout was obtained from the culvert location just ahead where material is eroding from the gully above the road
2.25	1.86	BEGIN DISTRESSED AREA.
2.26	1.87	DRAINAGE PROBLEM LEFT. PERCHED DRAINAGE IN THE ROAD CUT SLOPE. MOVING LOTS OF MATERIAL. SIGN POSTED ON TREE RIGHT STATING NO MOOSE HUNTING.
2.29	1.90	ANOTHER PERCHED DRAINAGE CHANNEL.
2.30	1.91	WIDENED AREA RIGHT ABOUT 150' LONG. - PARKING AREA FOR CHURCH.
2.36	1.97	END WIDE PARKING AREA. TELEPHONE PEDESTAL LEFT. OVERHEAD POWERLINE CROSSING -3 WIRE.
2.39	2.00	MILEPOST MARKER 2 RIGHT. SOME PAVEMENT DISTRESS.
2.55	2.16	PAVED PULLOUT RIGHT - 25' WIDE X 75' LONG. AREA LEFT OF ROAD BURNT IN 1988 FOREST FIRE.
2.70	2.31	MAJOR DRAINAGE. 80" X 112" STRUCTURAL PLATE PIPE IN GOOD CONDITION. LIVE STREAM. ROAD HAS GALVANIZED GUARDRAIL BOTH SIDE - ABOUT 60' EACH. This is Sheep Creek. An old bridge was replaced with this culvert in 1982. Wafer has went around the pipe and damaged



		the road. There is a major dumpsite (1939±) about 100 feet to the right of the road. The left side of the road is wet all the way into Cooke City.
2.80	2.41	BEGIN SLIDE AREA. MODERATE CUT SLOPE LEFT WEEPING WATER IN SPOTS. MODERATE FILL SLOPE RIGHT - 20'. 18" CULVERT AT THIS LOCATION.
2.82	2.43	WET CUT SLOPE WHICH IS SLUMPING. EQUIV. 18" ARCH
2.88	2.49	WET CUT SLOPE AT THIS LOCATION. 18" CULVERT. EVIDENCE OF FILL SLIDE FROM HERE BACK TO ODOMETER 2.82. DITCH LEFT IS WET AHEAD TO ODOMETER 2.96. PHOTOS J-4.4 AND J-4.5 AHEAD, J-4.6 BACK, J-4.7 AHEAD, AND J-4.8 BACK
2.90	2.51	NEW 16" X 21" CULVERT
2.94	2.55	NEW 16" X 21" CULVERT. CUT IS SLUMPING
2.96	2.57	CUTSLOPE IS SLUMPING AHEAD TO ODOMETER 3.08. STEEP DRIVEWAY LEFT.
3.10	2.71	PAVEMENT DISTRESS AHEAD TO ODOMETER 3.2. CUTSLOPE IS UNSTABLE. WATER IN DITCHLINE.
3.29	2.90	PAVEMENT DISTRESS. WATER SEEPING FROM CUT SLOPE. WET DITCHLINE
3.39	3.00	MILEPOST MARKER 3 RIGHT.
3.40	3.01	SIGN RIGHT: "HISTORIC POINT ½ MILE." BROWN AND WHITE.
3.40	3.01	WETLAND ALONG TOE OF FILL RIGHT TO ODOMETER 3.5.
3.58	3.19	BEGIN WIRE FENCE LEFT. TELEPHONE BURIED LEFT.
3.59	3.20	PAVED PULLOUT RIGHT FOR TWO HISTORIC SIGNS. ABOUT 20' WIDE BY 50' LONG. This turnout needs to be enlarged. Comfort facilities and a picnic area are planned. Two culverts just ahead of the signs have inadequate capacity. "COOKE CITY. IN 1870 A PARTY OF PROSPECTORS CAME INTO THIS COUNTRY BY WAY OF SODA BUTTE CREEK. THEY FOUND RICH FLOAT BUT WERE SET AFOOT BY INDIANS. CACHING THEIR SURPLUS SUPPLIES ON THE STREAM NOW CALLED CACHE CREEK, THEY MADE IT BACK TO THE YELLOWSTONE AND REPORTED THEIR FIND. IN THE NEXT FEW YEARS MANY PROSPECTORS COMBED THESE MOUNTAINS. THE FIRST REAL DEVELOPMENT BEGAN ABOUT 1876. CHIEF JOSEPH'S BAND OF FUGITIVE NES PERCE INDIANS CAME THROUGH HERE IN 1877. IN 1883 THERE WERE 135 LOG CABINS IN THE SETTLEMENT, TWO GENERAL STORES AND THIRTEEN SALOONS. COOKE CITY HAS BEEN WAITING FOR YEARS FOR REASONABLE TRANSPORTATION CONNECTIONS TO OUTSIDE WORLD SO THAT HER PROMISING ORE DEPOSITS MAY BE PROFITABLY MINED. SHE'S NO BLUSHING MAIDEN, BUT THIS HIGHWAY IS THE ANSWER TO HER PRAYERS." PHOTOS J-4.9 AND J-4.10. SIGN ON THE LEFT SAYS "DANGER. WATCH FOR SNOW EQUIPMENT. EQUIPMENT MAY OPERATE AGAINST TRAFFIC."
3.74	3.35	END WIRE FENCE LEFT.
3.75	3.36	US 212 ROUTE MARKER RIGHT. IN GENERAL, THE ALIGNMENT AND GRADE OF THIS SEGMENT IS NOT TOO BAD. PAVEMENT WIDTH IS THE MAJOR DEFICIENCY. THE ROAD HAS TRANSVERSE CRACKING ABOUT EVERY 50 TO 80 FEET AND SOME LONGITUDINAL CRACKING.
3.79	3.40	SIGN RIGHT: 25 MPH SPEED LIMIT. ENTERING COOKE CITY. WIDENED PAVEMENT SECTION BEGINS AT THIS POINT. ALSO WIDE PAVED PARKING STRIPS ALONG BOTH SIDES. GAS PUMP CLOSE TO THE LEFT EDGE OF THE PAVEMENT. PHOTOS J-4.11, J-4.12, G-1.19, AND G-1.20 AHEAD. There is a spring runoff problem at this location. Water runs down the ditch when the culvert plugs. There is a powerline in the culvert. There are buried gas tanks on the left.
	3.55✓	Underground waterline cross the road just ahead of the Fire Hall. It froze up this

		spring. There are 4 crossing in Cooke City. The Fire Hall has been used for public meetings.
4.02	3.63	COOKE CITY STORE RIGHT. NATIONAL HISTORIC LANDMARK AND IS ON THE NATIONAL REGISTER. PHOTOS G-1 .21 AND G-1 .22 AHEAD. The right-of-way line is at the door of the general store, and the right-of-way line is inside the Prospector Lodge and motel on the right. Gas tanks are inside the right-of-way.
4.16	3.77	PHOTOS G-1.23 AHEAD AND G-1.24 BACK.
4.29	3.90	END COOKE CITY BUSINESS DISTRICT. END PARKING STRIPS ALONG BOTH SIDES. COOKE CITY IS ANGLE, AND TAKES UP ROADSIDE. Parking is a big issue.
4.30	3.91	MILEPOST MARKER 4 RIGHT. PAVEMENT WIDTH =21'. GRADE STEEPNESS AT THIS POINT AHEAD. PHOTO G-1.25 BACK.
4.32	3.93	LARGE CULVERT - PIPE ARCH 4'6" WIDE X 3'4" HIGH. NEW CONDITION. This culvert was replaced about 4 years ago and is functioning OK. ROTATABLE SIGNS SPECIFYING ROAD CLOSED, TRAVEL AT YOUR OWN RISK, CLOSED TO WHEELED VEHICLES. THIS IS THE POINT AT WHICH SNOWPLOWING CEASES AND THE ROAD CORRIDOR IS MADE AVAILABLE FOR SNOWMOBILING.
4.39	4.00	NPS DISTANCE SIGN "JUNCTION 296 - 14 MILES; WEST SUMMIT -36 MILES; RED LODGE -64 MILES. PRIVATE PROPERTY MARKER LEFT. DRAINAGE PROBLEM LEFT WATER CHANNEL DOWN LEFT ROAD DITCH TO ODOMETER 4.32
4.40	4.01	SIGN LEFT: COOKE CITY (GREEN ON WHITE.) BEGIN SHARPER CURVES.
4.49	4.10	LIVE DRAINAGE DOWN CUT SLOPE. OLD 6' X 6' CONCRETE BOX IN POOR CONDITION. OUTLET SILTED 3/4 FULL. PHOTO J-4.15. This culvert has problems occasionally.
4.51	4.12	SIGN LEFT: "WELCOME TO COOKE CITY." ELEVATION 7651. FOUNDED 1893.
4.52	4.13	18" CULVERT. DRY STREAM. BEGIN AREA LEFT THAT BURNED IN 1988. TELEPHONE PEDESTAL LEFT.
4.60	4.21	SIGN RIGHT: "NATIONAL FOREST CAMPGROUND ½ MILE"
4.70	4.31	ROAD LEFT. Spring runoff is a problem. Water washed down the approach road and across the highway. It has washed rocks into the road. NPS TYPE SIGN "DAISY PASS - 5; LAKE ABUNDANCE TRAIL -5; LAKE ABUNDANCE -9. ROAD NOT MAINTAINED." ADDITIONAL SIGN ABOUT 100' UP THE APPROACH ROAD STATES THAT THIS IS GRIZZLY BEAR HABITAT. PHOTOS 1-4.13 AND J-4.14 LOOKING BACK AND RIGHT TO OLD MINING TAILINGS AREA THAT HAS BEEN PARTIALLY RECLAIMED. The reclaimed area is a CIRCLA Superfund site resulting from the old McClaren Mine tailings. It would not be desirable or likely to reopen the site for a waste area.
4.16	3.77	PHOTOS G-1.23 AHEAD AND G-1.24 BACK.
4.29	3.90	END COOKE CITY BUSINESS DISTRICT. END PARKING STRIPS ALONG BOTH SIDES. COOKE CITY IS ANGLE, AND TAKES UP ROADSIDE. Parking is a big issue.
4.30	3.91	MILEPOST MARKER 4 RIGHT. PAVEMENT WIDTH =21'. GRADE STEEPENS AT THIS POINT AHEAD. PHOTO G-1.25 BACK.
4.32	3.93	LARGE CULVERT - PIPE ARCH 4'6" WIDE X 3'4" HIGH. NEW CONDITION. This culvert was replaced about 4 years ago and is functioning OK. ROTATABLE SIGNS SPECIFYING ROAD CLOSED, TRAVEL AT YOUR OWN RISK, CLOSED TO WHEELED VEHICLES. THIS IS THE POINT AT WHICH SNOWPLOWING CEASES AND THE ROAD CORRIDOR IS MADE AVAILABLE FOR SNOWMOBILING.
0.17	4.48	BEGIN FENCE RIGHT. COOKE CITY CEMETERY.

0.19	4.50	SIGN RIGHT: COOKE CITY CEMETERY. PHOTOS 1-3.9, 1-3.10, AND J-3.11. PAVED WIDTH = 22'. COULD EASILY WIDEN TO THE LEFT.
0.21	4.52	END CEMETERY
0.22	4.53	APPROACH ROAD RIGHT TO SODA BUTTE CAMPGROUND. SIGN RIGHT: STOP SIGN FOR APPROACH ROAD. SIGN RIGHT: NF SODA BUTTE CAMPGROUND. DOES NOT HAVE ANY SPECIAL BASE. WATER TANK ABOUT 40' RIGHT OF PAVEMENT. The approach to Soda Butte Campground is to be relocated ahead to the meadow. No time frame for the relocation has been established - maybe 97 or 98. The tank ahead of the sign is the water supply for the campground.
	4.60±	Small culvert has inadequate capacity during the spring. Debris is a problem for some culverts in this area.
0.32	4.63	APPROACH ROAD LEFT. (LOGGING ROAD). BEGIN CURVY SECTION OF ROAD.
0.35	4.66	BRASS CAP IN ROCK RIGHT OF ROAD - USGS BM. Small culvert has inadequate capacity during the spring.
0.36	4.67	MINOR DRAINAGE - CULVERT. Small culvert has inadequate capacity during the spring.
	4.75 ±	Potential approach for new Soda Butte Campground road.
0.45	4.76	MINOR DRAINAGE - 18" CMP GOOD CONDITION. Small culvert has inadequate capacity during the spring. SIGN LEFT: NP CAMPGROUND 1/4 MILE
0.49	4.80	DRAINAGE - 30" CMP. RUSTY BOTTOM.
4.39	4.00	NPS DISTANCE SIGN "JUNCTION 296 - 14 MILES; WEST SUMMIT -36 MILES; RED LODGE -64 MILES. PRIVATE PROPERTY MARKER LEFT. DRAINAGE PROBLEM LEFT WATER CHANNEL DOWN LEFT ROAD DITCH TO ODOMETER 4.32
0.55	4.86	SHARPER REVERSE CURVES
0.58	4.89	DRAINAGE - 24" CMP.
		BURNED AREA TO THE LEFT FROM COOKE CITY. UNBURNED FOREST AREA TO THE RIGHT. ROAD HAS DOUBLE SOLID YELLOW CENTERLINE. NO SHOULDER STRIPE OR DELINEATORS. No mining claims according to Ken Carver.
0.67	4.98	MILEPOST MARKER 5 RIGHT.
0.69	5.00	CUT SLOPE LEFT IS STANDING ABOUT MAX. SLOPE FOR RE VEGETATION - 1 1/2 : 1 . MATERIAL LOOKS GRANULAR. CAMPGROUND BELOW ROAD TO THE RIGHT.
0.70	5.01	BIGGER DRAINAGE - 30" CMP. FILL SLOPE FAILURE ON LEFT FROM DITCH DRAINAGE LEFT. SHARP CURVE AREA.
0.72	5.03	HIGHER CUT SLOPE LEFT - LOOKS SILTY. ALLIGATOR CRACKING IN PAVEMENT.
0.87	5.18	HIGH FILL RIGHT. ROAD AT TOE OF FILL. There is an old dumpsite right of the road. It is not close.
0.91	5.22	LIVE STREAM – CONCRETE BOX 5' X 5'. GOOD CONDITION. This drainage has been a bad problem
1.03	5.34	GRAVEL PULLOUT RIGHT. APPROACH ROAD RIGHT. (SERVICE ROAD ONLY).
1.04	5.35	END SHARP CURVE AREA
1.24	5.55	. SIGN RIGHT: NF CAMPGROUND 1/4 MILE PAVED APPROACH ROAD RIGHT.
1.25	5.66	APPROACH ROAD LEFT. BARRICADED.
1.35	5.66	APPROACH ROAD LEFT TO LULU PASS. This is a County Road and will be the access to the proposed mine. It will be reconstructed to a 32' gravel surface. Water stands on both sides of the road at this point, but does not overtop the road.

		SIGN LEFT: GOOSE LAKE JEEP TRAIL 2 MILES; LULU PASS -5 MILES; ROAD NOT MAINTAINED.
1.37	5.68	DRAINAGE -124" AND 130" CMP. FAIR CONDITION.
1.43	5.74	OVERHEAD POWER CROSSING -4 WIRES.
1.44	5.75	SIGN RIGHT: STOP SIGN FOR APPROACH TELEPHONE PEDESTAL RIGHT.
1.48	5.79	SIGN LEFT: GALLATIN NF SIGN - COLTER CAMPGROUND. MOUND OF DIRT RIGHT FOR LOADING DOCK - MARKED PROPERTY OF THE US.
1.49	5.80	SIGN LEFT: STOP SIGN FOR APPROACH ROAD LEFT TO COLTER CAMPGROUND TELEPHONE PEDESTAL LEFT. GRIZZLY BEAR AREA. There is a waterline under the road which serves the campground.
1.57	5.88	WET AREA RIGHT SERIOUS CRACKING ALONG CENTERLINE – FROST HEAVE. SPRINGBOX RIGHT.
1.60	5.91	CRACK ENDS
1.66	5.97	POSSIBLE WETLANDS LEFT (FLAT MEADOW) BEGIN AREA WHERE ROAD GRADE NEEDS ELEVATED.
1.76	6.07	SIGN LEFT: NP CAMPGROUND 1/4 MILE
1.78	6.09	APPROACH ROAD RIGHT. (660)
1.79	6.10	APPROACH ROAD LEFT (661). TELEPHONE PEDESTAL LEFT.
1.83	6.14	WETLANDS LEFT AND RIGHT. (SHRUB/SEDGE). Water stands across the road up to 2' deep during the spring. Elevate the grade of the road through this area.
1.94	6.25	FROST HEAVE (CRACKS ON CENTERLINE.) POSSIBLE PRIVATE PROPERTY RIGHT. BARBED WIRE ALONG EDGE OF ROAD.
1.98	6.29	ROCK OUTCROP LEFT AND RIGHT. GRADE LINE OK AT THIS POINT.
2.03	6.34	APPROACH ROAD LEFT - "SAWMILL ROAD." TELEPHONE PEDESTAL LEFT ABOUT 120'. BEGIN WIDENED AREA LEFT. CABINS AND OTHER DEVELOPMENT ON THE LEFT APPROACHING COLTER PASS. There are buried gas tanks on the left in front of the A-frame building.
2.08	6.39	APPROACH ROAD LEFT - "COOKE PASS LANE." WETLAND RIGHT.
2.17	6.48	END WIDENED AREA. APPROACH TO COOKE PASS CAFE AND MOTEL. WETLANDS RIGHT
2.23	6.54	FENCE CORNER RIGHT. Water floods over the road 12" deep during the spring.
2.24	6.55	APPROACH ROAD RIGHT - PRIVATE DRIVE. (706)
2.31	6.62	BEGIN FENCE RIGHT (BUCK AND POLE) BIG BEAR LODGE RIGHT. BIG MOOSE RESORT AND MOTEL LEFT. GAS AVAILABLE LEFT.
2.35	6.66	OVERHEAD POWER - 2 WIRE. END BUCK AND POLE FENCE RIGHT. PRIVATE DRIVE RIGHT (718)
2.36	6.67	67 LIVE STREAM - DOUBLE 30" CMP, ONE PLUGGED SETTLEMENT IN ROAD OVER PIPE. FOREST BOUNDARY PHOTOS J-3.12, J-3.13, AND J-3.14 LOOKING BACK AT GAS PUMPS AND TOWN SITE. PHOTOS G-1.14 AND G-1.15 BACK. APPROACH ROAD LEFT. PAVED WIDTH = 22'. These culverts are a problem. There is a powerline through one of the culverts.
2.55	6.86	MILEPOST MARKER 7 RIGHT. SIGN RIGHT: WILDLIFE VIEWING AREA.
2.60	6.91	DRAINAGE - 18" CMP POOR CONDITION. WETLAND RIGHT. This area ponds water until late in the summer.
2.69	7.00	GRAVEL PULLOUT LEFT. WILDLIFE VIEWING AREA. TRAILS LEFT AND RIGHT. ALLIGATOR CRACKING IN ROAD.
2.72	7.03	SIGN LEFT: WILDLIFE VIEWING AREA.
2.74	7.05	SIGN RIGHT: CHIEF JOSEPH NF CAMPGROUND.
2.75	7.06	APPROACH ROAD RIGHT TO CHIEF JOSEPH CAMPGROUND. GRIZZLY BEAR USE AREA. WETLAND LEFT.
2.79	7.10	APPROACH ROAD LEFT. STOP SIGN. SIGN RIGHT: CLARKS FORK

		PICNIC AREA AND TRAILHEAD.
2.87	7.18	ROCK OUTCROP RIGHT. ROAD TO PICNIC AREA PARALLELING ROAD ON THE LEFT.
2.90	7.21	DRAINAGE - 18" CMP
2.91	7.22	ROCK OUTCROP ON THE RIGHT TO ODOMETER 2.98.
2.99	7.30	APPROACH ROAD RIGHT. MINOR APPROACH LEFT. SHARP CURVE TO THE LEFT
3.09	7.40	CRACKING IN CENTER OF ROAD.
3.12	7.43	SUMMIT COLTER PASS. The road does not have a posted speed limit and therefore defaults to 55 mph
3.21	7.52	APPROACH ROAD RIGHT AND LEFT
3.38	7.69	ROCK LINED DITCH RIGHT. DRAINS TO CULVERT AT ODOMETER 3.42. 18" CMP IN FAIR CONDITION. This culvert overflows and runs down the right ditch. Same problem at the next culvert also.
3.46	7.77	MAJOR DRAINAGE PROBLEM RIGHT. CUTTING DOWN CUT SLOPE AND PLUGGING ROAD DITCH. DOUBLE 30" CMP. ALLUVIAL FAN.
3.53	7.84	BEGIN TALUS AREA RIGHT. DRAINAGE - 30" CMP. PHOTOS 1-3.15 AHEAD, J-3.16 BACK, J-3.17 AND J-3.18 AHEAD OF TALUS SLOPE. It is not uncommon to have avalanches at this talus area as well as the next one.
3.54	7.85	MILEPOST MARKER 8 RIGHT.
3.55	7.86	SIGN RIGHT: WINDING ROAD WITH 30 MPH SPEED PLATE. PULLOUT RIGHT INTO AN OLD BORROW AREA. PAVED WIDTH = 22'. POSSIBLE MATERIALS SOURCE.
3.60	7.91	ROAD DISTRESS. High accident location - cars run off the road to the left over a high bank. Hazardous for traffic going downhill ahead on line.
3.67	7.98	END TALUS SIGN LEFT: 30 MPH ADVISORY SPEED PLATE
3.70	8.01	SIGN LEFT: WINDING ROAD WITH 30 MPH ADVISORY SPEED PLATE.
3.72	8.03	APPROACH ROAD LEFT. WETLAND RIGHT AND MINOR DRAINAGE.
3.94	8.25	BEGIN TALUS SLOPE RIGHT.
	8.35±	Most avalanches occur at this talus area. Some mountain sheep crossings have been noted in this area.
4.11	8.42	MONTANA/WYOMING STATE LINE. BEGIN 30' PAVED SECTION AHEAD. Some surface raveling has occurred, primarily from trucks refusing to remove their chains.
4.15	8.46	END TALUS SLOPE. POSSIBLE MATERIALS SOURCE. PHOTO J-3.19 BACK OF TALUS SLOPE.

# APPENDIX D

## PIR Guidelines

## PIR FORMAT

The following outline represents the major sections of Project Identification Report. The lead discipline is identified in parentheses. (The Programming staff will decide which chapters are not needed when setting up the review team based on the complexity of the project.)

- |                                    |                          |
|------------------------------------|--------------------------|
| 1. Executive Summary               | (Programming)            |
| 2. Purpose and Need Appendix       | (Programming & Planning) |
| 3. Design/Safety Appendix          | (Design)                 |
| 4. Environmental Appendix          | (Environment)            |
| 5. Geotechnical Appendix           | (Geotech)                |
| 6. Hydraulics / Hydrology Appendix | (Hydraulics)             |
| 7. Structures Appendix             | (Structures)             |
| 8. ROW / Utilities Appendix        | (ROW)                    |
| 9. Construction Appendix           | (Construction)           |
| 10. Project Proposal               | (Planning)               |
| 11. Road Log/Maps                  | (Design)                 |
| 12. Contacts                       | (Programming)            |

## APPENDIX FORMAT

Each technical discipline appendix will be presented in memorandum format. Each section should address issues and provide information with respect to the specific technical discipline. The following section headers will be required.

- *Introduction* – Includes location and date(s) of review
- *Project Description* – Brief description of the existing roadway and surrounding area.
- *Proposed Improvements* – Overall project proposal not discipline specific
- *Project (technical discipline) Elements* – Describe the elements for the specific technical discipline the project will address. For example, a geotechnical perspective may address elements such as landslide mitigation, pavement design, erosion control objectives, material sources, etc...
- *Complexity* – Includes coordination complexity (amount of coordination needed), technical complexity (technical difficulty), and environmental complexity/sensitivity (cultural, 4f, wetlands, etc.) This section should define the complexity of the elements described in the preceding section. Conceptual repair strategies would be identified. Include also any deviation from design standards and/or amount of engineering judgment, impacts, risks, probability of success of mitigation and other factors that may need to be thoroughly evaluated to determine the preferred courses of action.
- *Anticipated public support or opposition* – Amount of known opposition. Focus on political issues and not environmental complexity or sensitivity that may result because of selected repair strategies. Focus on whether project is high visibility project and /or fits agency niche. (Agency niche is the ability to balance engineering requirements with land management policies and their unique natural and cultural resources... or ...developing a project that blends with and enhances the natural environment.)



- *Undefined Scope of Work* –Identify the data needed or unknowns that currently exist for the project. This may include identification of major work activities or investigations needed to start project development phase.
- *Reconnaissance photos or data collected.*

## **PIR SECTION GUIDELINES**

### **Executive Summary**

The executive summary will describe the proposed project, identify funding, and recap the information found in the technical appendices identified above.

- *Briefly, discuss project scope and cover any prior project history that will help understand the situation.*
- *Have any commitments been made? Does the project have outside support or opposition?*
- *Under the Functional Classification, distinguish between "Major" and "Minor" collectors. Major collectors are eligible for Federal Aid funds, while minor collectors are not.*
- *Describe any inconsistency with the Forest Highway (FH) Program criteria noted in the Project Proposal.*
- *Include any item that could have a substantial impact on the cost/schedule of the project*
- *Identify if the project is located within a Metropolitan Planning Organization boundary, an air quality non-attainment area, or in close proximity to an Indian Reservation.*
- *Include a Regional Map that will show the limits of the FH route and the surrounding road network. Use any map that will clearly show the area, preferably color. Include a key map of the state with the project location marked on it. A CADD generated map suitable for the public notice should be considered at this point to avoid duplication of work.*
- *Include the FH inventory sheets with descriptions.*
- *The location of the project within the route, if applicable.*
- *Provide all route designations*
- *Summarize alternative strategies and project specific issues (e.g. opportunities, opposition and constraints by technical discipline.) This is not an all-inclusive list and reasonable alternatives will be identified in the NEPA process.*



- *Identify delivery schedule*

### **Purpose and Need Appendix**

Provide a concise discussion of the purpose and need of the proposal. Supplement with maps, charts, tables, letters, etc as needed. As applicable, discuss existing and forecasted traffic, level of service, capacity adequacy, and safety data. Include the physical, economic, social, and environmental constraints that would affect the solution.

- *The statements in this appendix must be specific enough to be measurable. For example, "lay the road lightly on the landscape" or "improve the alignment to improve safety" is too general. A better statement might be to "improve the alignment from Mile Post 4.0 to Mile Post 8.4 to meet minimum AASHTO geometric design standards."*
- *Adjectives that promote an unsubstantiated opinion such as "dangerous", "hazardous", or phrases such as "this curve caused six accidents" should not be used.*
- *Consider these questions: What is the problem? Does the discussion set the stage to conclude that the project is needed? How many fatalities? How much flooding? How much maintenance effort is needed? How much congestion?*
- *The discussion should make a convincing case that a solution to a problem is needed and that the purpose of the proposed project is to provide a solution that best solves the transportation problem.*

### **Design/Safety Appendix**

The design appendix should clearly identify any item that could have a substantial impact on the cost/schedule of the project. The following areas should be discussed:

1. Current and Future Road Use
2. Existing and Projected Traffic Volumes
3. Accident History
4. Existing Road Conditions and Summary of Deficiencies
5. Range of Possible Alternative Strategies for the Basis of Programming
6. Cost Estimate

*The key to this section of the report is to include those items necessary to demonstrate a "need" exists and to define the "need" in terms understandable to the general public.*

#### **Current and Future Road Use**

*Discussion should include the following:*

- *Current and possibly changing road uses. (School bus route, mail delivery route, commercial tour bus, commercial trucking, Federal & private logging, mining, bicycles, summer recreation, winter recreation, private property access, Scenic Byway, etc.)*

- *Current and possibly changing land uses. (Commercial developments, private subdivisions, recreational developments, etc. Are there any growth areas served by the facility?)*
- *System linkage (How does the project relate to the rest of the FH route as well as to the surrounding road network? Will the project reduce restrictions, such as gaps, bottlenecks, load limits, all weather travel, etc? What is the period of road use and the level of maintenance?)*
- *How the project fits into the overall management plans of the FS, the project owner, and other affected agencies. (What will be the effect on maintenance costs and user costs? How will the project affect the economy of maintenance and operation of the facility and the safety of its users? What will be the effect on economic development at the local, regional, or national level?)*

### Existing and Projected Traffic Volumes

*Discussion should include the following:*

- *How future road uses may affect traffic volumes over and above normal population growth rates.*
- *Identify the annual growth rate used for the traffic projections.*
- *Identify the basis for the current traffic volume, and show projections for the year of construction and 20 years from the date of construction.*
- *Identify the percentage and type of heavy vehicles in the traffic stream (trucks, buses, large RVs). Accurate numbers (existing data) are needed since heavy axle loads are the major factor in determining pavement thickness.*
- *Identify any directional distribution.*
- *Use appropriate maps, charts, graphs, tables, etc. as necessary to display the traffic information and make it clear to the reader.*
- *Seasonal uses that may affect the design traffic volume. If these uses are significant or if the road is closed in the winter, a Seasonal Average Daily Traffic (SADT) should be reported for design purposes.*
- *Potential for cumulative traffic increase as a result of project improvements.*

### Accident History

*Discussion should include the following:*

- *Source(s) of accident data and reliability of the information.*
- *An analysis of the accident data to identify hazardous locations or other significant information from the accident reports*
- *Calculated accident rates, and a comparison with statewide averages.*
- *Identify any fatal accident locations, and discuss reasons for the accident.*
- *Use appropriate maps, charts, graphs, tables, etc. as necessary to display the accident information and make it clear to the reader.*

### Existing Road Conditions

Discussion should include the following:

- *Surface Condition. Describe the condition of the riding surface of the road, edge drop-offs, major deficiencies, and contributing factors to the problems.*
- *Geometrics. Describe the roadway widths and horizontal and vertical alignments. Discuss the substandard features and major deficiencies, operational problems, etc. Include other geometric deficiencies as appropriate, such as superelevation, intersection problems, etc.*
- *Guidance and Roadside Safety Features. Describe the existing pavement markings, signing, delineation, guardrail, and roadside clear zone. Note any deficiencies. Describe roadside hazards, such as trees, utility poles, mailboxes, telephone pedestals, fences, buildings, etc.*
- *Conclude the section with a succinct summary of the deficiencies, which need to be corrected.*

### Alternative Strategies

*A RECOMMENDED alternative will not be shown for the project*

List alternative strategies for the purpose of programming to address the purpose and need. For each alternative, describe the type of construction (3R, reconstruction, or new construction), the road corridor location, termini, roadway width (travel lanes, and shoulders), design speed, pavement type, major structures, and safety features.

Compare each alternative strategy with the objectives identified for the project, and describe how the objectives are/are not met. Consideration should be given to acceptability of the strategy to users/client agencies, environmental acceptability (NEPA, permits, etc.), constructability and the acceptable level of risk to all cooperating agencies.

At a minimum, the discussion must include the following:

Reconstruction:

- *Discuss the advantages and disadvantages of each alternative strategy (safety, environment, maintenance, etc...).*
- *Determine what geometric road standards apply to this route. The standards should meet the minimum AASHTO guidelines, and should be consistent with the applicable Federal, State, and local standards/requirements of the owner agency for the affected road system.*
- *Use appropriate maps, charts, graphs, tables, etc. as necessary to display the information and make it clear to the reader.*

Cost Estimate

Do not include Preliminary Engineering or Construction Engineering costs in the cost estimate. These costs are programmed separately as line items in the Forest Highway program (15% of the program is retained for Preliminary Engineering, and 10% is retained for Construction Engineering). Show the cost per mile (kilometer).

Contingencies should be 25% at this stage; however, a higher or lower percentage may be used if justified. The contingency is expected to cover unanticipated items of work or cost increases.

Accurate initial estimates are important. The importance of these estimates cannot be overemphasized. A change in the estimated cost (programmed to contract award) **of more than 10% constitutes a change in the scope of work** and needs to be coordinated with programming. Poor initial estimates contribute to an unstable program.

Information that must be considered includes existing and forecasted traffic, materials information (particularly where foundation and slope stability problems can be anticipated), advance structure estimates for widening existing structures as well as new facilities, potential environmental issues and mitigation, right of way and utilities, traffic handling, etc.

The cost estimate should be prepared using the Project Cost Estimate Summary found in Appendix F. This will identify items that need to be considered and included in the project. It is very important that all known items of work be identified and estimated. It is recognized that not all projects will have each and every item listed on the estimate. In some instances, not all of the items can be identified at this stage and an appropriate contingency factor should therefore be applied to reflect other possible items.

## **Environmental Appendix**

The level of NEPA analysis and documentation is dependent upon the location, quantity and quality of environmental resources in the project area and the amount of potential impacts from the range of road improvement alternatives being considered.

- *Identify the probable environmental classification (Cat. Ex., EA, or EIS) for the various alternatives being considered.*
- *Also, list and briefly describe the major environmental resources and issues that will be affected by the proposed project. Mention if certain alternatives have more conflicts than others do.*
- *Identify the main federal, state, and local permits (and issuing agencies) that will probably be needed for the project. Briefly, describe any potential conflicts, difficulties, or special conditions that should be expected when applying for the permits.*
- *Include permits for off-site materials sources, waste areas, staging areas, etc.*

## **Geotechnical Appendix**

Describe any significant geotechnical problems, such as frost heave, landslides, oversteepened slopes, retaining walls, etc. Conceptual estimates will need to be made for roadway excavation, amount of borrow, length of retaining walls, amount of specialty embankments and slope protection.

Conclude the section with a succinct summary of the deficiencies that need to be corrected.

Provide information on available materials and/or water sources for the project. Early identification of potential sources is necessary to assess usability and to include the area in the environmental clearance for the project.

## **Hydraulics / Hydrology Appendix**

Describe any significant hydraulic problems, such as flooding, erosion problems, maintenance problems, etc. Conceptual estimates will need to be made for large drainage facilities, storm drains, cross drains, etc...

- Consideration should be given to the following when evaluating headwater/backwater conditions and flood frequency. Damage to adjacent properties, damage to structures and roadway, traffic interruptions, hazard to human life and damage to stream and floodplain environment.
- Assess overall structural condition of existing culverts.

- Identify apparent fish passage barriers. Coordinate fish-bearing streams locations with environmental specialist.
- Identify culvert replacements that have grades over 10% and need to be anchored.
- Consider flow rates to determine type of structure to be utilized. Culverts are generally capable of handling flow rates less than 30 m<sup>3</sup>/s.
- Culvert design should have depths and velocities comparable to the natural stream. If this is not possible, culverts may require baffles or other features in fish bearing streams.
- Identify scour damage.
- Will temporary detours need to be utilized during construction?
- Does existing structure have enough vertical clearance?
- Estimate amount of protective riprap revetment needed.
- Consider water quality and the effect of surface runoff in the area.

Conclude the section with a succinct summary of the deficiencies that need to be corrected.

### **Structures Appendix**

Describe any significant bridge problems or deficiencies, such as bridge rail, approach guardrail, etc. Information on condition and rating should be summarized from the Bridge Inspection Reports. Conceptual estimates of structure size and cost will need to be made.

Conclude the section with a succinct summary of the deficiencies that need to be corrected.

### **ROW / Utilities Appendix**

Identify the various land ownerships (private, state, federal) that will probably be impacted by the project and the approximate length of ownerships. Estimate the number of private parcels involved and list the width of the existing right-of-way if known. Briefly describe any known easements, such as railroads, fiber optic cables, power lines, etc., and if right-of-way will be needed for relocation. Describe any special environmental requirements affecting the right-of-way. List contact persons for all agencies involved in right-of-way transactions, and the location and contact person to get tax plats, records of survey, deeds, etc.

Identify the existing utilities along the proposed roadway corridor and describe the type, such as underground, overhead, joint use, etc. Identify any unusual or highly expensive utility relocation, such as fiber optic cables, high-pressure gas lines, high-voltage transmission towers, etc.

Briefly, describe any Special Use Permit requirements, and list the name of a contact person for each utility.

## **Construction Appendix**

The Construction Appendix is a description of the construction activities that will interfere with public traffic and identification of unusual construction methods or equipment that are not typical of Forest Highway construction projects. Identify potential detours, temporary structures, and road closures. Briefly discuss standard traffic control activities that will likely be required such as part-width control with flaggers and/or pilot cars. Examples of unusual construction methods or equipment that are not typical to Forest Highway projects would include items such as drilled shafts or soil-rock nailing. The Construction Appendix may refer to work descriptions in the other appendices.

# APPENDIX E

## Examples of PIR

## Technical Appendices





U.S. Department  
of Transportation

**Federal Highway  
Administration**

# Memorandum

WESTERN FEDERAL LANDS HIGHWAY DIVISION  
610 EAST FIFTH STREET  
VANCOUVER, WA 98661-3801

Subject: **INFORMATION:** Powers Highway Oregon Forest  
Highway Route No. 60 Geotechnical Project  
Identification Review

Date: November 18, 2002

Reply to: HFL-17

From: Senior Geotechnical Engineer

File:

Reference:

To:  
Oregon Design Operations Engineer

## A - INTRODUCTION

This memorandum provides field reconnaissance geotechnical information, for Powers Highway, Oregon Forest Highway Route No. 60, in southwestern Oregon. The information was obtained as part of the WFLHD's Project Identification Review ("PIR") process for a proposed Forest Highway reconstruction project on the Powers Highway, Oregon State Route 242. A WFLHD Geotechnical Team PIR Score Table is included in Appendix A. Reconnaissance photographs are contained in Attachment B. A preliminary erosion control checklist (discussed below under "Project Geotechnical Elements") is contained in Appendix C.

The Powers Highway is located in Coos County, Oregon. The project consists of two portions, one on Oregon State Route 242 intermittently from M.P. 4.4 to M.P. 8.4 addressing individual landslide sites. The county road segment of the Powers Highway proposed for construction under the Forest Highway Program begins at mile 19.0 and extends southeast for a distance of 4.0 miles to the forest boundary at mile 23.0. The Oregon State Route 242 provides the only year-round access to Powers, Oregon. It also provides access to the Siskiyou National Forest and is a major timber-hauling corridor.



## **PROJECT DESCRIPTION**

The Powers Highway closely parallels the South Fork Coquille River along the ODOT portion. It has short tangent sections and intermittent curves, some of which are “sharp” and “blind.” The USFS portion has longer tangent sections and intermittent curves. The setting of the roadway is a relatively narrow river valley, with the road traversing along the flank of hillsides. The river is frequently at the toe of the hillsides eroding into the slope and in some cases undercutting the roadway. This is particularly true along the ODOT portion of the project. Geotechnical Memorandum GM12-02

Both portions of the project have an ACP surface for the full length of the route. The paved width is substandard with sharp drop-offs to the river. The grade is generally flat to moderate and the asphalt concrete surface is in fair to poor condition. In general, evidence of major frost heave action was absent. Generally, the roadway surface appearance is smooth, and it appears that the subgrade is generally stable.

### **A - PROPOSED IMPROVEMENTS**

The proposed project would stabilize the roadway at twelve landslide locations along the ODOT section, upgrade or replace nine stream crossings, upgrade or replace twenty other drainage structures, and improve road safety through installation of guardrail, road realignment, and asphalt pavement overlay.

Along the USFS section from Powers at mile 19.0 to mile 23.0 improvements will consist primarily of asphalt resurfacing and minor guardrail additions.

### **B - GEOLOGY OF PROJECT AREA**

The roadway corridor lies in low-lying hilly terrain throughout the project length. Bedrock in the area is generally at shallow depths and consists of the Otter Point Formation. The Otter Point Formation is a tectonically sheared assemblage of sedimentary rocks. This formation is well known for regional and local mass movement. The project area to Powers is nearly wholly in an area geologically mapped as a hazard zone for earth flows and slumping.

The Burma Landslide is the most dramatic of the landslide areas addressed by the project proposal. The impacted road is about 2000 feet long. The landslide extends upslope a few thousand feet. According to ODOT file notes and correspondence it commonly moves in response to rainfall. Our field review indicated severe stream bank erosion. The immediate impact to the roadway appears to be more a result of the stream bank erosion. Remedial measures to mitigate landslide movement have consisted of horizontal drains and lightweight fill. All have failed to date to solve the landslide problem.

The other landslide sites between Broadbent and the Burma Landslide are also in the Otter Point Formation. The critical element that causes slide activity, and appears to generally be common to all sites, is severe stream bank erosion caused by the South Fork Coquille River. Loss of toe support at pre-existing landslide areas or loss of support at the toe of steep hillsides is causing

slope instability. Springs and high groundwater conditions are thought to be contributory to landslide movement.

## **C - PROJECT GEOTECHNICAL ELEMENTS**

The primary geotechnical elements of this project will be (1), landslide mitigation at twelve selected sites along the ODOT section; (2) pavement design; (3), erosion control objectives; (4), material sources; and (5), geotechnical investigation requirements. A brief discussion of each of the geotechnical elements is presented below:

### **(1) Landslide Mitigation at Twelve Selected Sites Along the ODOT Section**

**Overview of all twelve landslide sites.** The fills and natural slopes appear to be failing down to river level in the majority of cases. As with the majority of the landslides, the fundamental failure mechanism is one of the river cutting away the toe of the hillside. Hillside toe protection and stabilization would best mitigate the landslides. However, in-stream work and in-stream structures is likely unacceptable.

Complex geotechnical studies are needed to determine appropriate mitigation strategies. Impacts, risks, probability of success of mitigation, and other factors need to be thoroughly evaluated to determine the preferred courses of action. The PIR process neither has sufficient detailed information nor study effort to arrive at accurate alternatives in these cases. Cost estimates for the landslide sites should not be considered to be within common PIR accuracies. Whatever costs are determined should be considered no more accurate than +/- 30 percent.

#### **I. Landslide at M.P. 4.0**

This was the first landslide identified during the PIR review with ODOT staff. The outboard lane shows cracking to road centerline. The alternatives most apparent to construct are:

- Construct a soldier pile tied-back retaining wall off the outboard shoulder. The estimated rough wall length is 250 ft. Assume a wall height of 20 ft. Based on a design wall of 5,000 ft<sup>2</sup> at a cost of \$120/ft<sup>2</sup> the estimated cost for wall construction only, is \$600,000.
- An alternative viewed to be feasible in the field was to realign the road upslope to “move off” of the landslide. This does not preclude the probability that the landslide will enlarge at some future time, nor does it account for the uncertainty for upslope ground stability, but is a reasonable cost alternative.
- A third option is to build a buttress at river level to resist landslide movement. This, while technically has merit, is considered impractical.

## **II. Landslide at M.P. 4.4**

This and the following 10 landslides are in the same order as the ODOT table listing found in Ms. D'Agnese's letter of March 20, 2000. The alternatives most apparent to construct are:

- Construct a soldier pile tied-back retaining wall off the outboard shoulder. The estimated rough wall length is 80 ft. Assume a wall height of 20 ft. Based on a design wall of 1,600 ft<sup>2</sup> at a cost of \$120/ft<sup>2</sup>, the estimated cost for wall construction only, is \$190,000.
- An alternative viewed to be feasible in the field was to realign the road upslope to "move off" of the landslide. This does not preclude the probability that the landslide will enlarge at some future time, nor does it account for the uncertainty for upslope ground stability, but is a reasonable cost alternative.
- A third option is to build a buttress at river level to resist landslide movement. This, while technically has merit, is considered impractical due to environmental impact. This option is similar to ODOT's landslide rating system, see Ms. D'Agnese's letter of March 20, 2000, which indicates an option of complex drainage with shear key or buttress.

## **III. Landslide at M.P. 4.55**

This is a landslide extending down to river level. The apparent active portion intermittently reaches the roadway shoulder. The total roadway length is 325 ft. The road is thickly patched. It appears the full landslide area extends well above the roadway. Alternatives for PIR assessment are:

- Construct a soldier pile tied-back retaining wall off the outboard shoulder. The estimated rough wall length is 350 ft. Assume a wall height of 25 ft. Based on a design wall of 8,750 ft<sup>2</sup> at a cost of \$120/ft<sup>2</sup>, the estimated cost for wall construction only, is \$1,050,000.
- A second option is to build a buttress at river level to resist landslide movement. This, while technically has merit, is considered impractical due to environmental impact. This option is similar to ODOT's landslide rating system, see Ms. D'Agnese's letter of March 20, 2000, which indicates an option of complex drainage with shear key or buttress. This option would be less costly, however the first option cost estimate is recommended for use in the PIR.

## **IV. Landslide at M.P. 4.75**

This is a landslide extending down to river level. The apparent active portion reaches the roadway, and the roadway has heavy patching. The total roadway

length is 280 ft. It appears the full landslide area extends well above the roadway. Alternatives for PIR assessment are:

- Construct a soldier pile tied-back retaining wall off the outboard shoulder. The estimated rough wall length is 280 ft. Assume a wall height of 25 ft. Based on a design wall of 7,000 ft<sup>2</sup> at a cost of \$120/ft<sup>2</sup>, the estimated cost for wall construction only, is \$840,000.
- A second option is to build a buttress at river level to resist landslide movement. This, while technically has merit, is considered impractical due to environmental impact. This option is similar to ODOT's landslide rating system, see Ms. D'Agnese's letter of March 20, 2000, which indicates an option of complex drainage with shear key or buttress. This option would be less costly, however the first option cost estimate is recommended for use in the PIR.

**V. Landslide at M.P. 4.8**

This is a landslide extending down to river level. The road is about 60 ft above river level. The apparent active portion reaches the roadway. The landslide has instrumentation installed from geotechnical study efforts. The landslide is bounded on the south end by a bedrock outcrop. The total roadway length is 130 ft. Alternatives for PIR assessment are:

- Construct a soldier pile tied-back retaining wall off the outboard shoulder. The estimated rough wall length is 130 ft. Assume a wall height of 20 ft. Based on a design wall of 2,600 ft<sup>2</sup> at a cost of \$120/ft<sup>2</sup>, the estimated cost for wall construction only, is \$310,000.
- ODOT indicates that the concept in the "landslide rating system" has merit but reflects older cost data. That option is to construct a "gabion wall with stone embankment." For PIR purposes assume this option costs \$250,000 for wall and rock only.

**VI. Landslide at M.P. 5.1 — 5.2**

This landslide is a cut slope failure. It is a minor instability compared to the other sites. There appears to be no recent slope problems. Repair of the slide would consist of flattening the slope or to place a rock fill "inlay." The estimated cost for earthwork is about \$150,000 (+1-20 %).

**VII. Landslide at M.P. 5.9 — 6.0**

This is a landslide consisting of fill on native ground that is failing down to river level. The apparent active portion reaches the roadway. ODOT staff indicated no recent movement affecting the road. The road alignment is a very sharp "S curve." Bedrock exists in the inboard ditch and slope. This site appears to be an excellent site for realignment into the hill, moving away from the unstable slope.

Realignment would remove the “S curve” effect, and place the road on a bench into bedrock. Length of realignment would be about 500 ft.

**VIII. Landslide at M.P. 6.8 — 6.84**

This is a landslide extending down to river level. Hillside toe erosion is severe at river level. The apparent active portion intermittently reaches the roadway. The total roadway length is 245 ft. The road is patched. Alternatives for PIR assessment are:

- Construct a soldier pile tied-back retaining wall off the outboard shoulder. The estimated rough wall length is 245 ft. Assume a wall height of 20 ft. Based on a design wall of 4,900 ft<sup>2</sup> at a cost of \$ 120/ft<sup>2</sup>, the estimated cost for wall construction only, is \$590,000.
- A second option is to replace the culvert and reconstruct the embankment with a riprap toe at river level. This, while technically has merit, is considered impractical due to environmental impact. This option is similar to ODOT’s landslide rating system, see Ms. D’Agnese’s letter of March 20, 2000. This option would be less costly, in the order of \$400,000, however the first option cost estimate is recommended for use in the PIR.

**IX. Landslide at M.P. 6.84 — 7.0**

This is a landslide involving an unstable cutslope, and an unstable fill slope extending down to river level. Hillside toe erosion is severe at river level. The apparent active portion extends from river level to above the roadway. The cut slope portion has a roadway length of 250 ft. The fill slope portion has a roadway length of 380 ft. Alternatives for PIR assessment are:

**CUT SLOPE**

- Reslope the existing cut slope to a more stable inclination. The earthwork cost for this would be in the order of \$100,000.
- A second, more costly, option would be to place a stabilizing buttress and rock blanket on the slope. This option may have an advantage in preventing local slope failures due to seepage and complex geology. The reslope option is recommended for PIR use.

**FILL SLOPE**

- Construct a soldier pile tied-back retaining wall off the outboard shoulder. The estimated rough wall length is 380 ft. Assume a wall height of 20 ft. Based on a design wall of 4,900 ft<sup>2</sup> at a cost of \$120/ft<sup>2</sup> the estimated cost for wall construction only, is \$910,000.

- A second option is to build a buttress at river level to resist landslide movement. This, while technically has merit, is considered impractical due to environmental impact. This option is similar to ODOT's landslide rating system, see Ms. D'Agnese's letter of March 20, 2000, which indicates an option of buttress with shear key. This option would be less costly, may be found feasible during design, however the first option cost estimate is recommended for use in the PIR.

**X. Landslide at M.P. 7.0 — 7.1**

This site consists of three individual fill failures. It appears the roadway section can be repaired at each site with placement of buttresses with shear keys. Details of site geology are lacking. It is recommended to use ODOT's estimate of \$350,000 for construction of the buttresses. Traffic control and other contracting add-ons need to be included.

**XI. Landslide at M.P. 8.0**

This is a landslide extending down to river level. The apparent active portion reaches the roadway. The total roadway length is 80 ft. Alternatives for PIR assessment are:

- Construct a soldier pile tied-back retaining wall off the outboard shoulder. The estimated rough wall length is 80 ft. Assume a wall height of 15 ft. Based on a design wall cost of \$1 50/ft<sup>2</sup>, the estimated cost for wall construction only, is \$180,000.
- ODOT's "landslide rating system" indicates a buttress with shear key. This is a feasible option that may have undesirable impacts to the river. For PIR purposes assume the wall option.

**XII. Landslide at MP. 8.2 – 8.4 (Burma Landslide)**

The length of road impacted is about 2000 feet. Looking at test hole data and instrumentation data, and 1950s era studies provided by ODOT it appears the depth of landslide is in the order 30 feet to 50 feet.

- One option to fully stabilize the slide is a tied-back soldier pile wall. Assuming a 30 ft effective wall height we roughly estimate the wall cost at \$9,000,000. Need to add traffic control, grading, surfacing, etc. If the wall slide is deeper and say requires a 45 ft high wall then costs would be proportionately greater, say \$13,000,000.
- Another option ODOT conceptually considered is the use of horizontal drains. This is a moderate risk option (slightly better than a 50% chance of stabilizing the slide). The cost would be in the order of \$2,000,000. This number is in line with what the ODOT project submittal indicates.
- A third option, that we discussed in the field, and ODOT at least 25 years ago considered, is realignment of the road across the river. The ODOT file notes



indicate approximate terminations for realignment that extend well downstream. The ODOT files we believe predate the reconstructed roadway section from about M.P. 7.0 to 7.5. A shorter realignment tying into the reconstructed portion seems more logical at this time. It also avoids some of the soft ground alluded to in the ODOT notes along the old railroad alignment.

## (2) **Pavement Design**

The existing surfacing of the Powers Highway consists of asphalt concrete. The field review observed the asphalt concrete surface to be in fair to poor condition. Evidence of major frost heave action was absent. Generally, the roadway surface appearance is smooth, and it appears that the subgrade is generally stable.

The existing roadbed appeared to consist of silt, sand, and gravelly soil. The roadway appeared to be stable and it is expected that the existing materials will have sufficient strength to support the new base and pavement structure without the need for extensive subgrade subexcavation and replacement.

The design of the pavement structure will require sampling and testing of the existing surfacing and subgrade materials and a traffic analysis; however, for a preliminary “R-value” design, it can be assumed that the new pavement structure will consist of 225 mm (9 in.) of aggregate base and a 75 mm (3 in.) asphalt concrete driving surface. The final structural pavement recommendations will provide a structural section to meet the estimated 20-year design life based on traffic loading data. Should the subsurface investigation indicate the existence of quality in situ materials, these could be recycled and utilized in the new pavement section

## (3) **Erosion Control Objectives**

Erosion control during construction (short term) and post-construction (long term) will be required on this project. A preliminary assessment of the major processes contributing to erosion was made during the PIR review and is presented in the form of a checklist in Attachment C. A brief summary of the anticipated erosion processes and possible mitigation techniques is presented below:

- Heavy seepage should be expected from excavations in the landslide areas. Control of the seepage water is essential. Such mitigation might consist of horizontal drains drilled into the slope at locations of high visible seepage, runoff control channels excavated across or at the tops of the slopes, ditch underdrains, the construction of riprap “inlays” on the slope, and “laying back” slopes to flatter slope ratios that enhance revegetation.
- Fill slope erosion of existing fill slopes appears to be minor. However, exposure of newly constructed slopes to heavy rain can cause severe erosion. Revegetation at an



early part of the construction season that allows for establishment of new vegetation can mitigate the potential for damaged slopes.

**(4) Material Sources**

Mr. Jim Risley of ODOT indicated that most construction aggregate comes from commercial sources in Curry County. Coos County staff indicated that county sources might be available. The Eckley Pit leased from Georgia Pacific is approved for asphalt concrete aggregate. The McWilliams pit across from the Grayland Bridge near the middle of the project may be a suitable source for aggregate. The quality of the rock available at the locations listed above is unknown and sampling and testing of the materials would be required to establish their potential for use on this project. The sampling and testing of aggregate materials should verify that the materials conform to the WFLHD requirements for base and asphalt concrete paving aggregates described in Section 703 of the "FP-96".

**(5) Geotechnical Investigation Requirements and Cost Estimate**

The geotechnical investigation for this project will require the following activities:

- field work, including subsurface drilling and/or backhoe test pit exploration of the landslide areas to determine site characterization for determination of landslide correction alternatives
- subgrade investigation along the existing roadway
- sampling and testing of materials source(s)
- laboratory sample testing and analysis
- engineering analysis and geotechnical report writing

Following is a preliminary cost estimate of the geotechnical investigation outlined above assumes two curve realignments requiring drilling for cutslopes:

Field work, including surficial mapping, drilling and backhoe explorations for cutslope investigation:

60 days @ \$3000.00/day:	\$180,000.00
Subgrade investigation	
2 days @ \$1000.00/day	\$ 2,000.00
One materials source evaluation:	
2 days @ \$1000.00/day	\$ 2,000.00
Laboratory sample testing:	
Lump sum estimate @ \$10,000.00/day	\$ 15,000.00
Engineering Analysis:	
Lump sum estimate @ \$5000.00/day	\$ 20,000.00
Geotechnical Report:	
Lump sum estimate @ \$2000.00/day	\$ 5,000.00
 TOTAL INVESTIGATION COS	 \$224,000.000
 TOTAL COST (X) 15% CONTINGENCY	 \$258,000.000

## **D - PIR RATING EVALUATION**

- Complexity – high complexity due to landslides of extreme complexity. Are very complex. Coordination will not be difficult with ODOT staff.
- Liability –Pavement portion will be built to ODOT standards. Landslide will involve options with complex risks.
- Outside Influence no known opposition.
- High Profile –Moderate to high profile project.
- Undefined Scope of Work- geotechnical scope is poorly defined. Many unknowns exist for this project.

Technical Complexity Score = 9.5

Total Geotechnical PIR Score = 34.5

END MEMORANDUM

**POWERS HIGHWAY**  
**DATA GATHERING for EROSION CONTROL OBJECTIVES**

**DEFINITION:**

Erosion control objectives are those general mitigation approaches established at the beginning of project development; they are specific and appropriate for the site area, topography, climate, ground and surface water conditions, and vegetation; they evolve from an understanding of what will cause erosion (cause-effect); with the goal of first preventing erosion and then if need be control erosion.

**PURPOSE:**

The purpose of erosion control objectives is to establish a common understanding with client and permitting agencies specifically why we need to prevent and control erosion on the project (what are we protecting), defining specifically what mechanisms will cause erosion (e.g. sheetflow of water over the top of slopes, spring water flow, streambank erosion, wind erosion, rapid snow melt, etc.), then agreeing on the design product to be delivered to mitigate erosion (e.g. prevent sheetflow from cascading over the top of cutslopes causing gullyng and ruling, control stream channel configuration so as to pass water with minimal scour, etc.). The erosion control objectives then form the basis for the erosion control designer to develop appropriate specific mitigation designs to prevent and control erosion.

**HOW TO ESTABLISH EROSION CONTROL OBJECTIVES:**

Begin by focusing on erosion prevention, which requires knowing what potentially will cause erosion (e.g. sheetflow of water over the top of slopes, spring water flow, streambank erosion, wind erosion, rapid snow melt, etc.); consider the source area for the mover of the sediment (e.g. a shallow bowl shaped basin above a cut area); then consider how to control the mover of sediment (control the water or wind) rather than controlling the end product the sediment; and then consider controlling the sediment.

The following is a general five step process to establishing erosion control objectives:

Identify the initiators of erosion for the area (rainfall, seepage, springs, wind).

1. Visually survey the topography of the project to determine characteristic source areas where the water or wind can initiate erosion.
2. Visualize the mechanism causing erosion (e.g. a stream cutting its banks, sheetflow over the top of a cut)
3. Gather preliminary field technical data
4. Look at the soil types within the areas that could be eroded and get a feel for the erodibility of the material.

- ❑ Describe the type of vegetation that currently exists in the erosion areas, i.e. grass, trees, rock, etc.
  - ❑ Describe the aspect of the slope,
  - ❑ Describe temperatures in the area
  - ❑ Knowing the location of the project, describe the anticipated precipitation environment, i.e., arid, semiarid, rainy
  - ❑ Knowing the elevation, is snowmelt anticipated along with rain in the spring months?
  - ❑ Describe any problems with the existing vegetation take i.e., 50% bare slopes, sand dune area- no take, steep slope with vegetation brow- no take, ruled slope- no take
  - ❑ Estimate slope lengths
  - ❑ Describe any percolation aspects to the soils
5. Describe in writing, your erosion control objectives, generally what needs to be done to prevent erosion (e.g. control channel stream flow to rapidly pass through a culvert, or divert sheetflow at the top of cuts to a controlled drainage path)

### **HOW TO SOLVE THE EROSION CONTROL OBJECTIVES:**

#### **BRAINSTORMING EROSION PREVENTION TECHNIQUES AT EACH SITE**

Once the erosive nature has been investigated, brainstorm any possible prevention techniques at each major site, e.g.

- ❑ No river on the fill side, stay out of the cut and avoid erosion,
- ❑ River on the fill side, minimize cut slope length by incorporating cut walls,
- ❑ No cut wall options feasible, re-route sheet flow around cut and lay back slopes to encourage vegetation take,
- ❑ Threaten and endangered fish present in stream adjacent to cut, re-route sheet flow from ditch to sedimentation areas,
- ❑ Provide benches that drain to protected waterways

#### **BRAINSTORM WATER CONTROL AT EACH SITE**

Re-route, slow down, channel elsewhere, sedimentation basins, bermed away from sensitive areas, provide stream diversions, cover in any way possible all bare soil before rainfalls occur, funnel water to planned, protected waterways, etc.

#### **BRAINSTORM SOIL STRENGTHENING TECHNIQUES AT EACH SITE**

Use of soil lok during construction, track slope with equipment up and down the slope, provide rock in waterways, use additives in water truck to prevent dust,

#### **DOCUMENT ALL INFORMATION ON A CHECKLIST**

### CHECKLIST FOR EROSION MECHANISM, VEGETATION, SOILS, AND WATER

EROSION MECHANISM	HIGH LIKELIHOOD	AVERAGE LIKELIHOOD	LOW LIKELIHOOD	FIELD OBSERVATIONS / PREVENTION TECHNIQUES
Rainfall	X			
Wind		X		
Seepage / Springs	X			
Snowmelt			X	
Rain & Snowmelt			X	

VEGETATION	HIGH LIKELIHOOD	AVERAGE LIKELIHOOD	LOW LIKELIHOOD	FIELD OBSERVATIONS / PREVENTION TECHNIQUES
Grasses		X		
Shrubs		X		
Sagebrush			N/A	
Trees	X			
Other				

SOIL TYPE / SLOPE	HIGH LIKELIHOOD	AVERAGE LIKELIHOOD	LOW LIKELIHOOD	FIELD OBSERVATIONS
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CHARACTER				/ PREVENTION TECHNIQUES
Clay		X	X	
Silt	X			
Sand	X			
Gravels	X			
Boulders	X			
Rock		X		
Soil on Rock		X		
Percolation		X		
South Slope Aspect		X		
Slope lengths over 30m			X	

WATER & DRAINAGE TYPES /	HIGH LIKELIHOOD	AVERAGE LIKELIHOOD	LOW LIKELIHOOD	FIELD OBSERVATIONS / PREVENTION
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WATER FOR VEGETATION				TECHNIQUES
Sheetflow Off Cuts or Road		X		
Rills / Gullies		X		
Ditch Flow	X			
Streams Streams w/ Eroding Cut Banks	X			
Large Rivers	X			
Lack of H <sub>2</sub> O?			X	

#### BRAINSTORM POSSIBLE DESIGN PREVENTION TECHNIQUES

i.e., berms wattles on cuts to reduce slope length, ditch lining, sedimentation ponds or check dams, soil lok, temporary seeding, cut walls



# Memorandum

U.S. Department  
of Transportation

**Federal Highway  
Administration**

WESTERN FEDERAL LANDS HIGHWAY DIVISION  
610 EAST FIFTH STREET  
VANCOUVER, WA 98661-3801

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**INFORMATION:** Project Identification Report

Subject:

Powers Road  
Environmental Appendix

Date: November 21, 2001

From: Environmental Protection Specialist

Reply to: HFL-17

File: 304

Reference: #25093M\_DJS

To:

Forest Highway Program Coordinator

## **Purpose and Need/Objectives**

Please see the attached Proposed Purpose and Need.

## **Major Environmental Resources**

### **Threatened and Endangered Species**

Several T&E species may exist within the project area. Coho salmon, a listed species, are present within the South Fork Coquille River, which the Powers Highway follows. In addition, northern spotted owl and marbled murrelet may be present. Any work along this route will require field surveys to determine the presence of any T&E species, and the preparation of a BA to determine whether proposed improvements would impact the species if present. If any T&E species are affected, either informal or formal consultation with the National Marine Fisheries Service and the US Fish and Wildlife Service would be necessary. Given the presence of coho salmon with the South Fork Coquille River, the chances of needing to go through consultation on this project is high.

### **Archaeological/Historical**

An old railroad grade runs parallel to the Powers Highway, and if impacted, would need to be reviewed to see whether it is eligible for inclusion on the National Register of Historic Places. In addition, because the road is located close to the South Fork Coquille River, it is likely that some pre-historic sites exist within the project corridor. At a minimum, field surveys, including test probes, would need to be completed to determine whether any sites are present. Depending upon the results of those tests and the level of disturbance during construction, more work may need to be completed to clear this project through the Section 106 process.



## **Wetlands**

The Powers Highway is located along the South Fork Coquille River, and therefore, wetlands may exist within the project area. At a minimum, we would need to survey the project for wetlands. If wetlands are present and if any ground-disturbing work is done near these wetlands, a wetland delineation report would need to be completed. If the project impacts any of these wetlands, a more detailed report and investigation would need to be completed. This more detailed report would cover the function and value of the wetlands being impacted, would identify potential mitigation areas, and would have at the least a preliminary wetlands mitigation plan. The FHWA would need to obtain a Section 404 Permit from the US Army Corps of Engineers and a Removal/Fill Permit from the Oregon Division of State Lands for any impacts to wetlands.

## **Wild & Scenic Rivers**

The South Fork Coquille River is not listed as a Wild & Scenic River nor has it been Congressionally designated a Study River.

## **Section 4(f)**

The Myrtle Grove State Park, the Albert H. Powers Memorial Wayside, and the Powers County Park are located near the project. In addition, an old railroad grade runs parallel to the Powers Highway. All of these are resources protected under Section 4(f) of 49 U.S.C. 303. Any work that permanently incorporates land from these resources into a transportation facility, causes a temporary occupancy of land from these resources that is adverse in terms of the preservationist purposes of Section 4(f), or results in a constructive use of these resources, will require a Section 4(f) evaluation. Under a Section 4(f) evaluation, one must prove that there is no other prudent or feasible alternative to impacting the Section 4(f) resource.

## **Level of NEPA Analysis**

This project will require an Environmental Assessment to make an accurate determination of what resources exist within the project area and what impacts this project would have on those resources. Once an EA is completed we would make the determination of whether this project would have a significant environmental impacts. If no significant environmental impacts were identified, we could finish the NEPA documentation with a Finding of No Significant Impact. However, if significant impacts were identified, an Environmental Impact Statement would need to be prepared. If no significant impacts were identified through the preparation of an EA, the NEPA documentation for this project could be completed in about three years. So, if you started the NEPA analysis for this project in January of 2003, you should have a completed NEPA document (EA) by January of 2006.

## Permits

Federal Permits	Yes	Maybe	No
US Army Corps of Engineers Section 404 Permit, Clean Water Act		<b>X</b>	
US Coast Guard Permit, Rivers & Harbors Act & Surface Transportation Act			<b>X</b>
Special Use Permit (USDA Forest Service)		<b>X</b>	
National Pollutant Discharge Elimination System (NPDES)	<b>X</b>		
State Permits			
Removal-Fill Permit, Division of State Lands		<b>X</b>	
Surface Mining Permit, Department of Geology and Mineral Industries		<b>X</b>	
Oregon Shoreline Development Permit, Oregon Land Conservation and Development Commission			<b>X</b>
Permit to Operate Power Equipment, Oregon Department of Forestry		<b>X</b>	
Air Containment Discharge Permit, Department of Environmental Quality		<b>X</b>	
Notification of Operations, Oregon Department of Forestry		<b>X</b>	
Burn Permit, Oregon Department of Forestry		<b>X</b>	
Other: State Scenic Waterways, NPDES, Section 401 Certification	<b>X</b>		

## Complexity

A project that spans about 18 miles, is going to be completed in four stages, and runs along a river that contains T&E fish species is going to be fairly complex. How complex depends on the level of disturbance and what impacts result from the disturbance. On a scale of 1 to 10, 1 being the least complex and 10 being the most complex, I would rate this project a 7. One thing in our favor is that improving the route should not cause a lot of public controversy.

## Liability

Please see the Design Appendix.

## Outside Influence

This project will be well received for the most part. The Powers Highway is the only access to the City of Powers and to the surrounding private, public, and Forest Service lands. Beyond Powers the road connects to the Rouge River in the Agness area. The route links to the South Fork Coquille Corridor Project (Forest Service), can serve as an emergency detour route for Highway 101, accesses the Powers-Glendale Bicycle Route, and is a scenic byway. The road is viewed as an important transportation facility, and is need of repair to keep it operational.

Residents of Powers have been very vocal about their support for improving the Powers Highway—in 2000 a delegation from Powers visited the State Capitol and lobbied for funding to improve this route. Their efforts caught the attention of Senator Gordon Smith, who supports improving this route. In addition, several organizations in the area have written letters of support for this project, including the Coos County Commissioners, Coos County Parks, the Powers School District, and the Coos County Sheriff’s Office.

### **High Profile**

This project likely will be high profile to people who are served by the Powers Highway. As mentioned under Outside Influence, the road is viewed as an important transportation facility that is need of repair. People in the area probably feel that repairs are long overdue, and they will be concerned with what happens on this project. However, the concern will probably be limited to the local level. Although high profile to those affected by the route, it is not likely this project would be high profile on a statewide level.

### **Undefined Scope of Work**

Considering all of the potential issues that exist with widening this road, it would be difficult to develop a firm-fixed price task order for this project.

## PIR Environmental Checklist

<i>Project Name:</i> Powers Highway—Rogue Rehabilitation		<i>Prepared by:</i> FHWA		<i>Date:</i> 11/21/02	
<i>Route &amp; Site Id.:</i> Forest Highway 60, MP 4.4 to MP 23.0		<i>State:</i> Oregon		<i>Forest/Reservation/BLM District</i> OREGON DEPART. OF TRANSPORTATION SISKIYOU NATIONAL FOREST	
<i>Brief Project Description:</i> The project is located along the Powers Highway between MP 4.4 and MP 32.0. This section of highway has numerous areas that are prone to slide failures, have inadequate stream crossings and other drainage structures, does not meet current safety standards, and has several areas where the pavement is deteriorating. These deficiencies are a concern given the important nature of the Powers Highway. This highway is the only access to the City of Powers and to the surrounding private, public, and Forest Service lands. Beyond Powers the road connects to the Rouge River in the Agness area. The route links to the South Fork Coquille Corridor Project (Forest Service), can serve as an emergency detour route for Highway 101, accesses the Powers-Glendale Bicycle Route, and is a scenic byway		<i>Repair</i>		<i>Reconstruct</i>	
				<i>Other</i>	
				X	
<i>Purpose of Project (improve safety, restore access, structural stability, etc.):</i> The purpose of this project is to improve safety and to make improvements to keep this route fully functional. Repairing the degrading pavement conditions, widening the narrow traveling lanes where necessary, correcting alignment deficiencies, repairing landslide areas, and upgrading stream crossings and drainage features will accomplish this.					
<i>Contact</i>		<i>Name</i>		<i>Role</i>	
<i>Related Plans and Documents (Land Management Plans, Transportation Plans):</i> National forest land management plans, State of Oregon transportation plans, Coos County transportation plans, and the City of Powers <i>From Vision to Action Strategic Plan</i> .					
<u>Will The Following Be Affected?</u>					
<i>Resource/Effect</i>					
<b>A. Soils and Geological Features (erosion, compaction, caves, etc.):</b> <input type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> maybe					
Please see information that the geotechnical specialist provided for the PIR Report.					
<b>B. Air (non-attainment area, etc.):</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> maybe					
This site is in an area that is in attainment for air quality standards as listed on the <i>No attainment Areas for All Criteria Pollutants</i> for Oregon at: <a href="http://www.epa.gov/oar/oaqps/greenbook/ancl.html#OREGON">http://www.epa.gov/oar/oaqps/greenbook/ancl.html#OREGON</a> . By requiring the contractor to bury or chip cleaning debris, impacts to air quality would be non-existent to minimal.					

<b>C. Water (In-stream work, regulated flood plain, discharge to surface waters, Wild &amp; Scenic River, Coastal Zone Mgmt. Act, etc.):</b>	<input type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> maybe
Please see write up in 11/21/02 Environmental Appendix for the Powers Highway PIR.	
<b>D. Wetlands/Riparian Areas (area, potential mitigation):</b>	<input type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> maybe
Please see write up in 11/21/02 Environmental Appendix for the Powers Highway PIR.	
<b>E. Flora/Fauna (old growth, fish passage/habitat, threatened/endangered/sensitive, etc.):</b>	<input type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> maybe
Please see write up in 11/21/02 Environmental Appendix for the Powers Highway PIR.	
<b>F. Land Use (change farm/forest or other use, require right-of-way, etc.):</b>	<input type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> maybe
If land from private residencies, the Siskiyou National Forest, or any of the publicly owned parks is permanently incorporated into a transportation facility, this would be a change in land use.	
<b>G. Visual (scenic route, special visual feature, etc.):</b>	<input type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> maybe
The Powers Highway is a Scenic Byway and runs along the South Fork Coquille River. The project has the potential to affect both the Scenic Byway and the river.	
<b>H. Cultural (archaeological, historic, sacred, etc.):</b>	<input type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> maybe
Please see the write up in the 11/21/02 Environmental Appendix for the Powers Highway PIR.	
<b>I. Hazardous Waste (abandoned gas station, mining operation, underground storage tank, etc.):</b>	<input type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> maybe
Most likely there are no hazardous waste sites within the project area, but a survey would need to be completed to make a final determination.	
<b>J. Socio-Economic (displacement, employment, etc.):</b>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> maybe
It is not likely that this project would greatly alter the socio-economics of the area in any way.	
<b>K. Noise (sensitive receptor nearby, etc.):</b>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> maybe
Considering the rural nature of the project area, it is unlikely that any noise-related impacts would occur as a result of this project.	
<b>L. Transportation (bike paths, detours/delays, accessibility, etc.):</b>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> maybe
No negative impacts to transportation would occur as a result of this project. This project would serve to improve transportation in this area.	
<b>M. Utilities</b>	<input type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> maybe
Aerial and underground telephone lines, including Verizon's traditional cable and AT&T's fiber-optic cable, are present within the project area. In addition, Pacific Power and Light and Coos-Curry Electrical Coop have aerial electrical lines within the project area. Relocation probably will be required in some places.	

**N. Recreation**☐yes ☒no ☐maybe

It is unlikely that any negative impacts to recreation would occur as a result of this project. Improving the road would benefit recreation.

**O. Public Services**☐yes ☒no ☐maybe

It is unlikely that public services would be negatively affected by this project.

**P. Section 4(f) (public park/recreation area, wildlife/waterfowl refuge, cultural resources, etc.):**☐yes ☐no ☒maybe

Please see write up in 11/21/02 Environmental Appendix for the Powers Highway PIR.

**Q. Cumulative Effects:**☐yes ☒no ☐maybe

AT THIS POINT NO OTHER PROJECTS ADJACENT TO THIS PROPOSED PROJECT HAVE BEEN IDENTIFIED, AND IT IS UNLIKELY THAT THIS PROJECT WOULD RESULT IN ANY NEGATIVE CUMULATIVE EFFECTS.

**R. Indirect Effects:**☐yes ☐no ☒maybe

AT THIS EARLY STAGE, IT IS DIFFICULT TO DETERMINE WHETHER THIS PROJECT WOULD HAVE ANY INDIRECT EFFECTS.

**S. Public Controversy:**☐yes ☐no ☒maybe

THIS ROUTE IS AN IMPORTANT TRANSPORTATION FACILITY, AND MOST PEOPLE PROBABLY WOULD SUPPORT IMPROVING IT. AS WITH ALL PROJECTS, IT WILL BE IMPORTANT TO BALANCE TRANSPORTATION NEEDS WITH THE NEED TO PROTECT THE ENVIRONMENT.

<i><b>Federal</b></i>	<i><b>Comments</b></i>	<i><b>State</b></i>	<i><b>Comments</b></i>
Clean Water Act, Section 404 Permit	Possible—the South Fork Coquille River and its tributaries are present.	Removal Fill Permit	Possible—the South Fork Coquille River and its tributaries are present.
Section 4(f)	Possible if protected resources that are present are affected.	Burn Permit	No-require the contractor to bury or shred clearing debris.
106 Process	Possible if Archaeological resources are present within the project area.		
Endangered Species Act, Section 7	Likely—endangered fish species are present.		
NPDES	Yes		
Wild and Scenic Rivers Act	No.		

# APPENDIX F

## Project Cost Estimate Summary

## Project Description

Alternative:

<b>1. Roadway Items</b>	Quantity	Unit	Unit Price	Unit Cost	
Earthwork					
Roadway Excavation				\$	
Imported Borrow				\$	
Clearing & Grubbing				\$	
Water / Dust Abatement				\$	
			<b>Total Earthwork</b>		<b>\$</b>
<b>2. Structural Section</b>	Quantity	Unit	Unit Price	Unit Cost	Quantity
Asphalt Concrete				\$	
Aggregate Base				\$	
Aggregate Subbase				\$	
Permeable Blankets & Edge Drains				\$	
			<b>Total Structural Section</b>		<b>\$</b>
<b>3. Drainage</b>	Quantity	Unit	Unit Price	Unit Cost	
Large Drainage Facilities				\$	
Storm Drains				\$	
X-drains, etc				\$	
			<b>Total Drainage</b>		<b>\$</b>



<b>4. Specialty Items</b>	Quantity	Unit	Unit Price	Unit Cost
Retaining Walls				\$
Specialty Embankments				\$
Erosion Control /				\$
Revegetation				
Riprap				\$
Slope Protection				\$
Barriers and Guardrail				\$
Enhancements				\$
Survey				\$
Environmental Mitigation				\$
<b>Total Specialty Items</b>				<u>\$</u>
<b>5. Traffic Items</b>	Quantity	Unit	Unit Price	Unit Cost
Permanent Traffic Control & Signing				\$
Temporary Traffic Control & Signing				\$
<b>Total Traffic Items</b>				<u>\$</u>
<b>Minor Items</b>		Unit	Unit Price	Unit Cost
<b>Subtotal Section 1 -5</b>			X (10%)	\$ <u>\$</u>
<b>Total Minor Items</b>				
<b>Roadway Mobilization</b>				
Subtotal Section 1 -5			X (10%)	\$ \$
Minor Items			X (10%)	\$ \$
<b>Total Mobilization</b>				\$
<b>TOTAL ROADWAY ITEMS</b>				\$

Structure Items	No. 1	No. 2	No. 3
Bridge Name			
Structure Type			
Width			
Span Length			
Total Area	0	0	0
Footing Type			
Cost per Sq. Ft. or Sq. Meter *			
Total Cost for Structure			
Other			
*include 10% mobilization			
<b>TOTAL STUCTURE ITEMS</b>			<b>\$ _____</b>

Right of Way / Utilities	Unit Cost
Acquisition	
Utility Relocation	
<b>TOTAL ROW / UTILITIES</b>	<b>\$ _____</b>

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## CHAPTER 3

# ENVIRONMENT

### 3.1 GENERAL

The purpose of this Chapter is to provide guidance on the process and reporting requirements to comply with Federal statutes, executive orders and regulations concerning Social, Economic and Environmental (SEE) aspects introduced into the highway program during the past four decades. The 1950's emphasized public hearings concerning highway bypasses and impacts on local economics and wildlife resources. The emphasis of the 1960's was for highway projects to be compatible with local planning and to consider their impacts on civil rights, parklands, archeology and history. The 1970's involved more specific identification and balancing of impacts on the natural and human environment.

The environmental process (as defined by the operational procedures contained herein) is based on the Federal Lands Highway (FLH) Divisions' efforts to meet the requirements of the Council on Environmental Quality (CEQ) and DOT Order 5610 1C and [23 CFR 771](#). The implementing procedures that have been developed ensure that proper considerations are given to SEE impacts during the development of highways. The Direct Federal Nationwide Action Plan was developed to meet these requirements (see [Section 3.2.4](#)).

Although the environmental process is an integral part of the conceptual studies stage (see [Chapter 4](#)) during development of highway improvements, it continues throughout the entire spectrum of highway planning, design and construction activities.

Depending upon the magnitude of the highway improvement and its location, the environmental process may range from a minimal effort to a major effort using substantial resources and time, with public and interagency involvement.

The SEE effects of alternatives are identified and compared. Resultant decisions may be to proceed with a build alternative (with agreed upon mitigation measures), to recycle the proposal for further study and/or additional public involvement or to abandon the proposal (no-build).

Environmental clearance of a proposal constitutes approval of the general highway location (corridor) and approval to begin detail design.

The environmental procedures outlined herein apply to projects that come under the decision-making responsibilities of the FLH Divisions. These environmental procedures apply to several types of projects (e.g., forest highways, defense access highways, Indian reservation roads, emergency relief (ERFO) projects, public lands highways when FLH is the lead agency unless other environmental procedures are specified in the project agreement). The State environmental procedures apply for those projects where the FLH Divisions serve basically as consultants to a State Highway Agency.

Unless otherwise stipulated in a project agreement, when the land management agency maintains lead agency responsibility (other than the FLH Division or the State Highway Agency),

neither the State environmental procedures nor the Direct Federal procedures will apply. For these projects, the rules and procedures of the principal land management agency are applicable and the FLH Division basically performs as a consultant.

With the completion of the environmental process, the highway designer is given the scope of the project including the approved alternative, preliminary design standards, corridor location and environmental mitigation commitments. These elements provide substantial input and direction into the subsequent design phase.

### **3.1.1     *National Environmental Policy Act (NEPA)***

NEPA, enacted in 1969, is the basic national charter for protection of the environment. It establishes policy, sets goals and provides means for carrying out the policy. NEPA is the most sweeping of all pieces of environmental legislation since it deals with the total impact on the natural and human environment. NEPA applies to every Federal agency. On major Federal actions it requires a systematic, interdisciplinary approach in planning, decision making and consultation with other Federal, State and local agencies. Public involvement is an integral part of the environmental/conceptual studies design process that ensures adequate opportunity for citizen and/or agency input and an exchange of views. Many States have also passed environmental policy acts similar to NEPA and these may require separate attention.

Since NEPA is a broad based statute, it has been necessary to enact numerous other statutes and executive orders to provide specific directions and procedures to protect all important environmental concerns. [Section 3.5](#) contains a list of legislation, orders and actions or approvals required from other agencies.

### **3.1.2     Section 4(f)**

Section 4(f) is an enacted DOT regulation, originally contained in the *1966 Transportation Act* that is now codified in [23 USC 138](#) and [49 USC 303](#), which substantially restricts the use of publicly owned special purpose land for transportation facilities. The regulation states that the Secretary shall not approve any program or project that requires the use of publicly owned land from public parks, recreational areas, wildlife and waterfowl refuges and historic sites of national, State or local significance for a highway unless there is no feasible and prudent alternative to the use of this land, and the program includes all possible planning to minimize harm to Section 4(f) lands resulting from highway usage.

Section 4(f) preceded NEPA by several years and resulted in several significant court decisions requiring extraordinary measures to be taken to avoid or minimize harm to Section 4(f) lands.

Procedures to protect Section 4(f) sites are included in DOT Order 5610.1C, [23 CFR 771](#) and the Direct Federal Nationwide Action Plan. Documentation and reporting criteria is included in [FHWA Technical Advisory T6640.8A](#).

## 3.2 GUIDANCE AND REFERENCES

Numerous guidance, advisory and regulatory procedures have been written to assist in carrying out NEPA and other environmental statutes and orders. Copies of these procedures, addressed in the following discussions, are available in the Environmental Planning Unit in each FLH Division.

### 3.2.1 Council on Environmental Quality (CEQ) Regulations

The Council on Environmental Quality (CEQ) was established in the Executive Branch by NEPA to advise the President about environmental matters and to guide Federal agencies in complying with the procedures and goals of NEPA. These directions are included in the CEQ Regulations ([40 CFR 1500-1508](#)) for implementing the provisions of NEPA. The CEQ regulations also include the pertinent requirements of separate statutes and executive orders on the protection and enhancement of environmental quality.

The CEQ regulations require Federal agencies to develop supplementary procedures applicable to each agency's programs and responsibilities.

### 3.2.2 Procedures for Considering Environmental Impacts (DOT Order 5610.1C)

This order implements the provisions of Section 102(2) of NEPA, the CEQ regulations and the statutes and executive orders for Federal Highways.

The order also implements the following:

- Section 4(f) regulations,
- [Clean Air Act](#),
- [Historic Preservation Act](#),
- Coastal Zone Management Regulations,
- [Fish and Wildlife Act](#),
- [Endangered Species Act](#), and
- Water Pollution Control Regulations.

The DOT order includes procedures relative to environmental impacts in decision making and directs that information of proposed DOT agency actions be made available to public officials and the general public through appropriate documents. This order also requires DOT agencies (e.g., FHWA, UMPTA) to develop supplementary implementing procedures.

### 3.2.3 Environmental Impact and Related Procedures ([23 CFR 771](#))

These are FHWA/UMPTA regulations that incorporate the requirements of the CEQ regulations and DOT Order 5610.1C. They also set forth procedures for complying with other environmental statutes, principally Section 4(f) of the *DOT Act of 1966* and Section 136(b) of the *1970 Federal-aid Highway Act*. These regulations are cross-referenced in [49 CFR 622](#). None



of the above three regulations (CEQ, DOT Order 5610.1C and [23 CFR 771](#)) are all inclusive; all three must be consulted to satisfy all environmental requirements.

### 3.2.4 Direct Federal Nationwide Action Plan

Section 136(b) of the *1970 Federal-aid Highway Act* ([23 USC 109\(h\)](#)) directed the Secretary of Transportation to promulgate guidelines designed to ensure that possible adverse Social, Economic and Environmental (SEE) effects of Federal-aid highway projects are fully considered and that final decisions are made in the best overall public interest.

These requirements were set forth in State and Direct Federal Action Plans that included organizational responsibilities and procedures for achieving the following objectives:

- increased involvement of the public, groups and other agencies in the planning and development of projects;
- use of a systematic interdisciplinary approach;
- identification of SEE effects; and
- consideration of other courses of action that would include alternative types and varying magnitudes of highway improvements, other transportation modes or no action.

The Direct Federal Nationwide Action Plan incorporates those requirements and facilitates compliance with other environmental requirements.

FHWA no longer requires highway agencies to document their procedures through action plans. However, if action plans are not used, agencies must substitute other documentation of their procedures. These procedures shall be acceptable to FHWA and shall be understandable and accessible to the public. FLH Division offices shall continue to use the Direct Federal Nationwide Action Plan.

A national committee was established and given the responsibility for updating and keeping the action plan current. The committee is composed of representatives from the following offices:

- Federal Lands Highway Office,
- Office of Environmental Policy,
- Federal Lands Highway Division offices, and
- Federal Land Management Agency offices.

An action plan committee was also formed in each of the Federal Lands Highway Division offices with the following responsibilities:

- assist in the implementation of the action plan,
- make reviews, provide guidance and determine direction during a project development stage; and
- ensure commitments are incorporated into the project design and construction.

### **3.2.5     [Guidance for the Preparation and Processing of Environmental and Related Documents \(FHWA Technical Advisory T6640.8A \(1987\)\)](#)**

This advisory provides guidance in the preparation of environmental documents relevant to NEPA and Section 4(f). It addresses CE and EA/FONSI determinations, supplemental EIS's, EIS reevaluations and Section 4(f) evaluations.

The advisory also provides the guidance required by [23 USC 109\(h\)](#) to ensure that possible adverse Social, Economic and Environmental (SEE) effects of proposed actions are evaluated. Consideration of these factors satisfies the reporting requirements of [23 USC 128](#). [Technical Advisory T 6640.8A](#) is not regulatory.

### **3.3 INFORMATION GATHERING AND COORDINATION**

#### **3.3.1 General**

Information gathering is continuous throughout the stages of planning and programming, conceptual studies and design. See [Section 3.4](#) for a complete understanding of important engineering and SEE information that must be gathered and assessed to satisfy specific needs or requirements.

The process of identifying needs for project selection, during planning and programming and conceptual studies, is based on engineering and reconnaissance studies describing the physical conditions, current deficiencies, future road needs and estimates of needed improvements and costs.

Engineering and SEE information gathered during environmental/conceptual studies for a proposed project is more specific than reconnaissance studies since reasonable engineering alternatives and their relative costs or impacts must be considered using an interdisciplinary approach, involving other agencies having special expertise or jurisdictional authority, special interest groups and the public.

Interagency and interdisciplinary involvement continues into the design stage where engineering and SEE information may be even more specific as important design elements are refined. At this stage, sound engineering principles should be applied to minimize adverse impacts while maximizing benefits for important SEE aspects.

#### **3.3.2 Information Gathering**

The following provides some of the ways information is gathered and disseminated:

- Issuing a letter of intent or a questionnaire describing the scope of proposals to newspapers, other agencies and to groups, persons or organizations asking for comments.
- Establishing contact with those cooperating agencies having jurisdiction on some aspect of the proposal.
- Conducting public and interagency meetings and hearings to explain the proposal and provide a forum for an open exchange of views.
- Undertaking studies or research by specialists in various disciplines in FHWA, other agencies or consultants.
- Forming a task force composed of in-house and other agency specialists during project development activities.
- Establishing a SEE Study Team.

### **3.3.3 Project Coordination**

The many facets of environmental/public involvement require detailed and continuous coordination throughout conceptual studies and design. The Environmental Planning Engineer, assisted as needed by location and/or design engineers, develops and performs the following:

- coordinates the public involvement process;
- prepares environmental documents to comply with environmental laws and regulations;
- initiates and coordinates SEE activities with Federal, State and local agencies, citizen groups and individuals;
- engages consultants for needed expertise;
- collects data and performs environmental studies;
- identifies and analyzes SEE effects;
- recommends measures to mitigate adverse effects for reasonable engineering alternatives as well as the no-action alternative;
- monitors construction of selected projects to provide feedback concerning environmental information to be used in the development of future projects, and to accumulate actual as-constructed environmental data; and
- reviews selected completed projects to determine if they were constructed in conformance with the environmental commitments and if mitigation measures were effective.

### **3.3.4 SEE Study Team**

A SEE Study Team also assists environmental planning and engineering offices in coordinating major proposals during conceptual studies and design.

The team is composed of representatives from the applicable land management agency, Federal Lands Highway Division office and the highway agency with support help from other agencies as needed.

The SEE Study Team performs as follows:

- acts as a steering team for project development activities (e.g., public involvement events, field and office reviews and interagency meetings);
- correlates SEE impacts and engineering needs; and
- represents and advises its agency of any consequences of alternative highway locations and designs.

The SEE Study Team members have the authority to:

- make commitments concerning alternatives; and
- call on needed and available disciplines within the agency (natural, social and technical services and environmental design graphics, as needed, are represented depending on the type of project and impacts foreseen).

### 3.4 ENVIRONMENTAL ANALYSIS AND PUBLIC INVOLVEMENT

The environmental analysis and public involvement phases use the early information and coordination data to further define and develop the appropriate environmental processes. The various aspects of the proposed improvements are evaluated to determine the scope and nature of subsequent actions required for the environmental clearances and other project development processes. The many factors and alternatives that may be involved require continuing coordination and input from a variety of sources.

The analyses of important environmental aspects during the conceptual studies and design phase should have sufficient scientific and analytical substance to provide a basis for evaluating the alternatives. Include in the analyses, any information, issues, values or other ongoing or planned activities that may have an impact on the evaluation and selection of an alternative. Photographs, illustrations and other graphics may provide a clear understanding of the impacted area. Identify significant SEE effects and make an assessment of the estimated costs, financial and otherwise, of eliminating or minimizing anticipated adverse effects.

The reconnaissance report will include the results of engineering and SEE aspect studies and recommendations. See [Chapter 4](#) and/or the appropriate environmental document addressed in this Chapter for more information.

The disciplines of the highway, land management and resource agencies (also consultants if needed) are used in the environmental analyses. See Section 4 of the Direct Federal Nationwide Action Plan.

#### 3.4.1 Environmental Considerations

Full consideration of favorable or adverse SEE effects and decisions to be made in the best overall public interest require a careful analysis of reasonable alternatives. There is no absolute scale on which a project's desirability can be measured. Only by assessing the SEE effects of all reasonable alternatives can sound judgments be reached. One alternative that must be considered is to do nothing. While this alternative may highlight adverse effects, it also provides a basis for presenting the needs for, and benefits of, the proposed project and the harmful effects of delay or abandonment.

The environmental process requires significant determinations and potential mitigation measures that concern important aspects affected by a proposed project. The following are some examples:

- social aspects include the total effects on the quality of living,
- economic aspects include the total effects on the material needs of people, and
- environmental aspects include the total effects on the human and natural environment.

Consideration of reasonable alternatives should include possible effects on a broad range of SEE aspects. However, the consideration given to each aspect will vary with the characteristics of the area traversed. SEE aspects that are determined relatively unimportant or minimally affected should be eliminated early in the conceptual studies phase, while important SEE aspects should be studied and, if necessary, mitigated during the conceptual studies and design

phases in consultation with land management, natural resource agencies, environmental and special interest organizations, the concerned public and agencies having jurisdiction by statute.

Consideration is given to the consequences and impacts of the proposed project on the following typical environmental and potentially significant features:

- land use,
- farmlands,
- social/economic changes,
- pedestrians/bicyclists,
- air/noise/energy,
- water quality,
- stream modification,
- floodplains/wetlands/riparian vegetation,
- wild and scenic rivers,
- coastal zones,
- threatened/endangered species,
- historical/archeological preservation,
- hazardous waste sites,
- visual/recreational/vegetation,
- construction,
- cumulative impacts,
- relationship of local short-term uses versus long-term productivity,
- irreversible and irretrievable commitment of resources, and
- environmental justice

Some environmental aspects requiring special considerations or procedures are as follows:

- Flood plains and wetlands that cannot be avoided may require preparation of a formal Only (flood plains) or No (wetlands) Practicable Alternative Finding.
- If a threatened or endangered species may be affected, a formal biological assessment is written and consultation achieved with the US Fish and Wildlife Service concerning mitigation measures. Biological evaluations are required if a Forest Service designated sensitive species may be affected.
- A survey of the proposed corridor must be made concerning possible cultural resources. When sites are found, a determination of eligibility to the Federal Register of Historic Places is made. Consultation and/or agreement shall be reached with the applicable State Historic Preservation Officer (SHPO) and Advisory Council on Historic Preservation concerning disposition of any significant sites (see [Section 3.6.2.4](#)).
- Extraordinary measures must be taken to avoid and/or minimize harm to Section 4(f) lands (see [Sections 3.1.2](#) and [3.6.1](#)).

A sample of a SEE checklist is shown in [Exhibit 3.4-A](#). The use of this type of checklist is encouraged to assist in tracking the numerous SEE aspects and to provide a method of documenting any need for additional action on specific subjects. See the FHWA [Technical Advisory T6640.8A](#) for additional information on SEE considerations.

### 3.4.2 Project Classification

Projects are classified into one of three categories that prescribe the level of activity and type of documentation required for the environmental clearance process ([23 CFR 771](#)). The numerical designation assigned to a project indicates the type of project, its degree of complexity and the extent of the SEE study needed.

During the first steps of the environmental/conceptual studies analysis, the Action Plan Committee (APC) assigns the classification of the proposed project that indicates the type of environmental document to be prepared. The committee may be guided by the SEE Study Team (see [Section 3.3.4](#)) and environmental planning recommendations, as well as other financial, engineering, traffic and safety considerations, including comments received from agencies and the public.

The project categories are defined below:

1. **Class I.** Actions that significantly effect the environment (EIS).
2. **Class II.** Actions that do not individually or cumulative have a significant environmental effect (CE).
3. **Class III.** Actions in which the significance of the environmental impact are not clearly established (EA).

The minimum level of activities required for each classification is shown in [Exhibit 3.4-B](#). Section 5 of the Direct Federal Nationwide Action Plan illustrates each step in the project development process and highlights interagency and public involvement in both written and flow chart form. The flow charts are shown in [Exhibit 3.4-C](#).

The APC takes one of the following possible actions:

- Assigns the project to the Class I category because of identified significant SEE impacts or an environmentally controversial proposal. A full EIS process is required.
- Assigns the project to the Class II category for approval as a CE by the Division Engineer. This decision may be deferred until appropriate SEE studies are completed.
- Assigns the project to the Class III category requiring the preparation of an EA to determine the significance of the environmental impacts.

This early classification may be changed by the APC as the SEE Study Team and the environmental planning office evaluate the input from early coordination, analyze the SEE effects and recommend a different category.



## SOCIAL, ECONOMIC, AND ENVIRONMENTAL CHECKLIST

Project Identification: \_\_\_\_\_

Checklist prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

**Instructions:** Complete Column A by checking appropriate action response to questions. If action response is Yes, check proper response in Column B. Place a check mark in Column C on those issues considered important and requiring additional discussion or documentation.

**PHYSICAL.** Will the proposal either directly or indirectly:

1. Change the topography or ground surface relief features?
2. Destroy, cover or modify any unique geologic or physical features?
3. Result in unstable earth surfaces or exposure of people or property to seismic or geologic hazards?
4. Result in or be affected by soil erosion or siltation whether by water or wind?
5. Result in a change in the rate of use of any natural resource? (Include energy fuels.)
6. Result in substantial depletion of any nonrenewable natural resource?
7. Benefit or hinder mining, well drilling, timber production, grazing or other natural resource activity?
8. Result in solid waste or litter control problem?
9. Modify the channel or change the water currents of a river or stream or the bed of the ocean or any bay, inlet or lake?
10. Affect any "Wild and Scenic River's" natural, cultural and recreational value?
11. Cause or be affected by flooding, floodwaters or tidal waves?
12. Cause or be affected by flooding, floodwaters or tidal waves?

A		B		C	
SEE ACTION		Important Issue or Concern?		Additional Discussion Required?	
Yes	No	Yes	No	Yes	No

**Exhibit 3.4-A SAMPLE CHECKLIST FOR SEE EFFECTS**

## SOCIAL, ECONOMIC, AND ENVIRONMENTAL CHECKLIST

**PHYSICAL** (Continued). Will the proposal either directly or indirectly:

13. Affect surface water, groundwater, public water supply or sole source aquifer?
14. Adversely affect water quality?
15. Change the absorption rates, drainage patterns or rate and amount of surface water runoff?
16. Result in substantial air emissions or adverse effects on or deterioration of ambient air quality?
17. Be consistent with the State Implementation Plan for air quality?
18. Result in noise levels that are inconsistent with Federal, State or local noise standards?

**BIOLOGICAL.** Will the proposal either directly or indirectly:

19. Result in change in the diversity of species or number of any species of plant (including trees, shrubs, grass, crops, microflora and aquatic plants)?
20. Effect critical habitat of any unique, rare, threatened or endangered species of plant?
22. Result in removal or deterioration of existing fish or wildlife habitat?
23. Change the diversity of species or number of any species of animal (e.g., birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?
24. Reduce the number of any unique, rare, threatened or endangered species of animal?
25. Take area wildlife or waterfowl refuges?
26. Take wetland area?
27. Result in the formation of new wetland?

**SOCIAL AND ECONOMIC.** Will the proposal directly or indirectly:

28. Be inconsistent with any elements of adopted community plans, policies and goals (e.g., land use plans, management goals)?

## Environmental Analysis and Public Involvement

<b>SOCIAL, ECONOMIC, AND ENVIRONMENTAL CHECKLIST</b>  <b>SOCIAL AND ECONOMIC</b> (Continued). Will the proposal directly or indirectly:	<b>A</b>		<b>B</b>		<b>C</b>	
	<b>SEE ACTION</b>		<b>Important Issue or Concern?</b>		<b>Additional Discussion Required?</b>	
	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>
29. Affect the location, distribution, density or growth rate of the human population of an area?						
30. Affect life styles or neighborhood character or disrupt an established community?						
31. Affect minority, elderly, handicapped or other specific interest groups?						
32. Affect existing housing, require the displacement of people or create a demand for additional housing?						
33. Affect employment, industry or commerce, or require the displacement of business or farms?						
34. Result in the reduction of area of any prime or unique farmland?						
35. Result in the reduction of area of any prime or unique farmland?						
36. Affect property values or the local tax base?						
37. Affect any community facilities (including medical, educational, scientific, recreational, pedestrian and cultural or religious institutions, ceremonial sites or sacred shrines)?						
38. Affect public utilities or police, fire, emergency or other public services?						
39. Have substantial impact on existing transportation systems or alter present patterns of circulation or movement of people and/or goods?						
40. Affect vehicular movements or generate additional traffic?						
41. Affect or be affected by existing parking facilities or result in demand for new parking?						
42. Increase traffic hazard to motor vehicles, bicyclists or pedestrians?						
43. Involve a substantial risk of an explosion or the release of hazardous substances in the event of an accident or upset condition?						
44. Affect public health, expose people to potential health hazards or create a real or potential health hazard?						

**Exhibit 3.4-A SAMPLE CHECKLIST FOR SEE EFFECTS**  
(Continued)

SOCIAL, ECONOMIC, AND ENVIRONMENTAL CHECKLIST	A		B		C	
	SEE ACTION		Important Issue or Concern?		Additional Discussion Required?	
	Yes	No	Yes	No	Yes	No
<b>SOCIAL AND ECONOMIC</b> (Continued). Will the proposal directly or indirectly:						
45. Affect a significant archeological, historical or cultural site, structure, object or building?						
46. Affect natural landmarks or manmade resources?						
47. Affect publicly-owner parklands or recreational areas?						
<b>OTHER ENVIRONMENTAL CONSIDERATIONS.</b> Will the proposal directly or indirectly:						
48. Result in increased demand on existing sources of energy?						
49. Affect any scenic resources or result in the obstruction of any scenic vista or view open to the public or create an aesthetically offensive site open to public view?						
50. Result in impacts associated with construction activities (e.g., noise, dust, temporary drainage, traffic detours, temporary access)?						
51. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals. <sup>1</sup>						
52. Does the project have environmental effects that are limited individually, but cumulatively considerable? <sup>2</sup>						
53. _____						
_____						
_____						
53. _____						
_____						
_____						
<sup>1</sup> A short-term impact on the environment is one that occurs in a relatively brief, definitive period of time while long-term impacts will ensure well into the future.						
<sup>2</sup> Cumulatively considerable means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, current projects and probable future projects. It includes the effects of other projects which interact with this project, and together, would be considerable.						

**Exhibit 3.4-A SAMPLE CHECKLIST FOR SEE EFFECTS**  
(Continued)

Level of Activity	Class I	Class II	Class III	
Environmental Studies	Yes	Yes	Yes	
Significant Impacts	Yes	No	Yes	No
Opportunity for Public Meeting	As Appropriate	No <sup>2</sup>	As Appropriate <sup>3</sup>	As Appropriate
Opportunity for Public Hearing	Yes	As Appropriate	Yes <sup>3</sup>	As Appropriate
Final Environmental Documentation	EIS	CE	EIS <sup>3</sup>	EA <sup>3</sup>
Results	ROD	CE	ROD <sup>3</sup>	FONSI
<p><sup>1</sup> See <a href="#">Section 3.4.2</a> and <a href="#">23 CFR 771</a> for project category classifications.</p> <p><sup>2</sup> For minor projects (e.g., surfacing, reconstruction and widening existing lanes, adding auxiliary lanes where little or no additional right-of-way is required, installing traffic controls), public hearings are not required and public meetings are generally not requested by the public.</p> <p><sup>3</sup> Projects initially classified as Class III but later determined to have significant impacts will be considered to be in the Class I category and treated accordingly.</p>				

### Exhibit 3.4-B MINIMUM LEVEL OF ACTIVITY BY PROJECT CATEGORY<sup>1</sup>

#### 3.4.3 Scoping

Scoping is a process for determining the range of issues to be considered in evaluating the environmental impact of a proposal. The scoping process stresses early coordination among agencies involved with or affected by the proposal as well as early public involvement.

The purpose of scoping is to do the following:

- Determine the scope of a proposal's impact limits, its range of alternatives and the significant issues to be analyzed, and to evaluate mitigation measures.
- Identify and eliminate from the detailed study the issues that are not significant or that have been covered by prior environmental documents. The discussion of these issues should be narrowed to a brief presentation of why they will not have a significant effect on the human environment.
- Identify other environmental review consultation requirements so analyses and studies can be integrated.

**LEGEND:**

**APC** Action Plan Committee  
**DEIS** Draft Environmental Impact Statement  
**EA** Environmental Assessment  
**EIS** Environmental Impact Statement  
**EPA** Environmental Protection Agency  
**EPU** Environmental Planning Unit

**FEIS** Final Environmental Impact Statement  
**FHWA** Federal Highway Administration  
**FLHD** Federal Lands Highway Division  
**FONSI** Finding of No Significant Impact  
**HA** Highway Agency  
**LMA** Land Management Agency  
**SEE** Social, Economic, and Environmental  
**SNRA** State Natural Resources Agency  
**SPOC** Single Point of Contact

**Responsible  
Agencies or Groups**

FHWA,  
HA, LMA

FHWA,  
HA, LMA

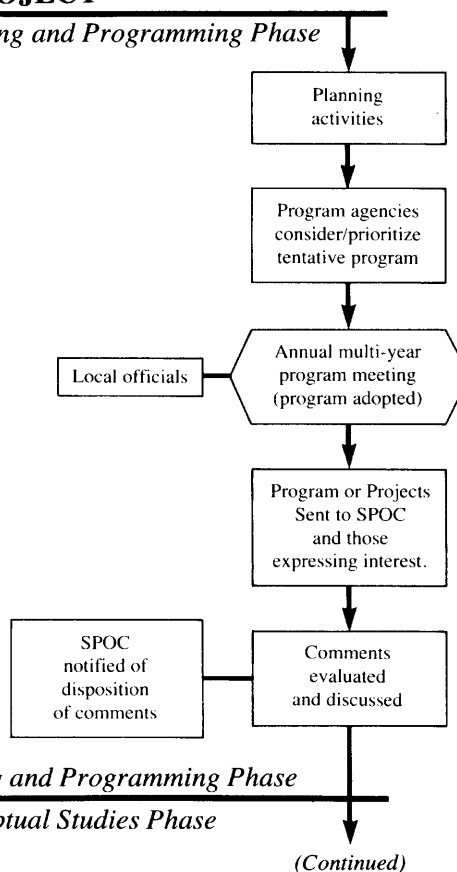
FHWA,  
HA, LMA

FHWA,  
HA

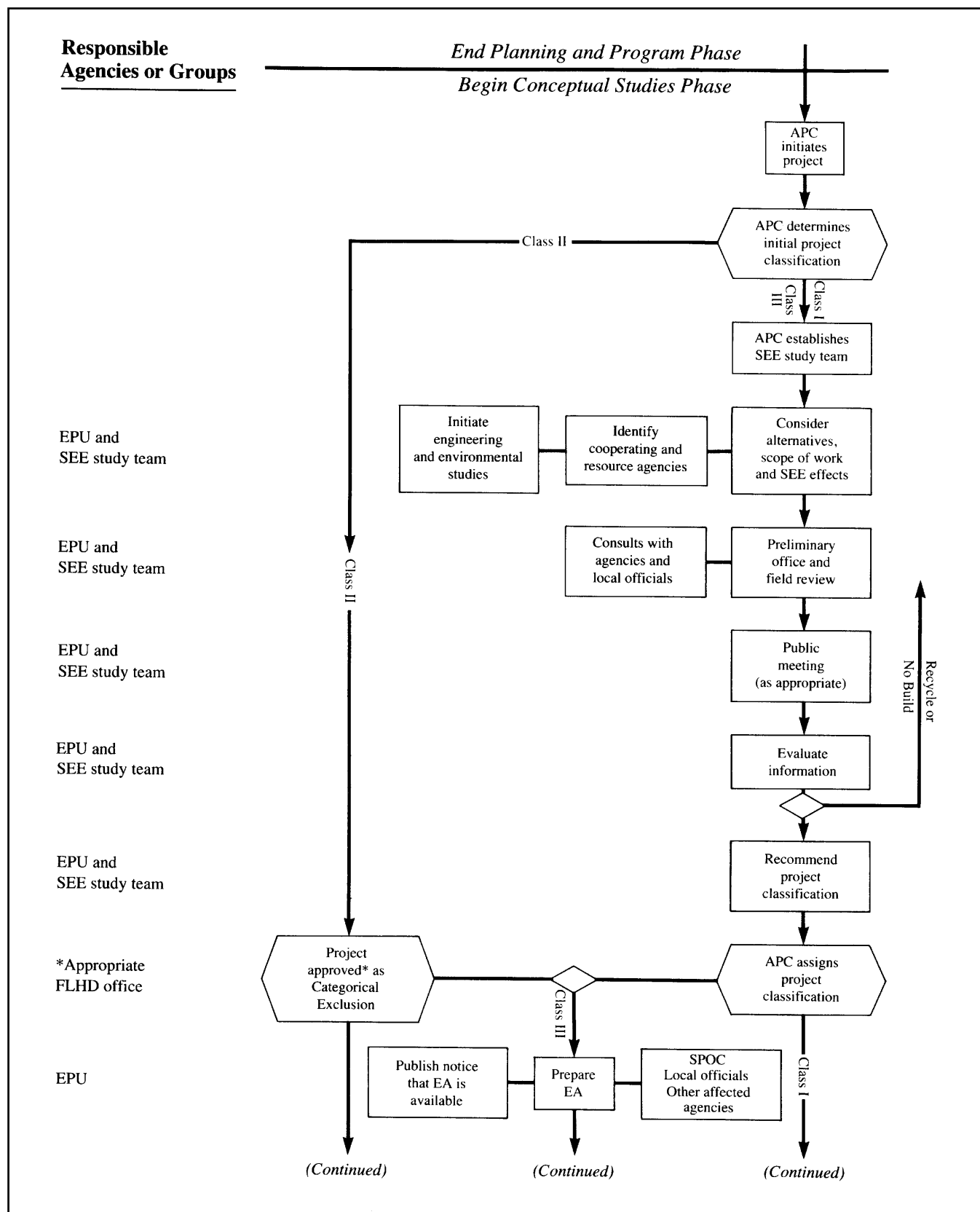
FHWA,  
HA, LMA

**BEGIN PROJECT**

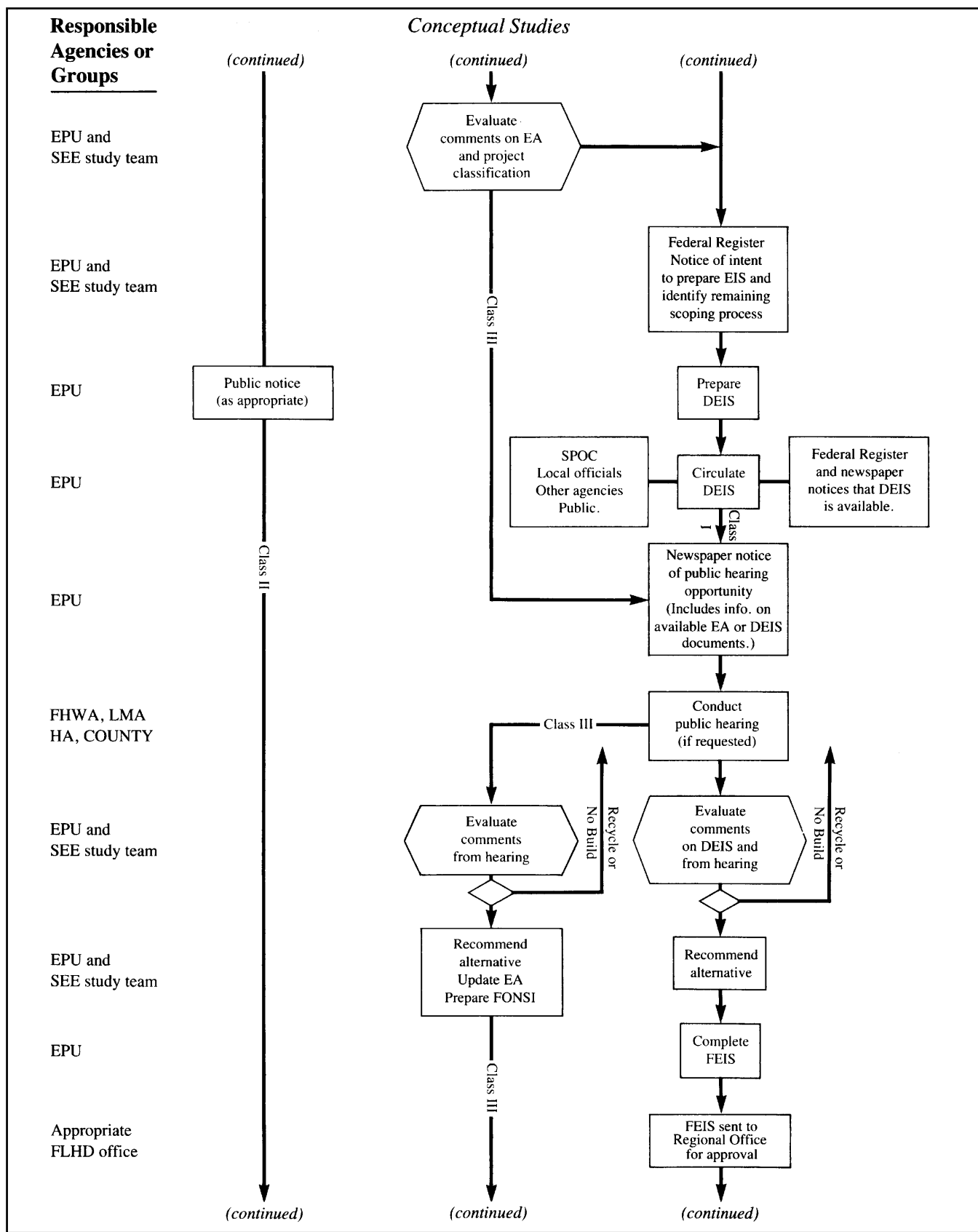
*Begin Planning and Programming Phase*



**Exhibit 3.4-C PROJECT DEVELOPMENT PROCESS**

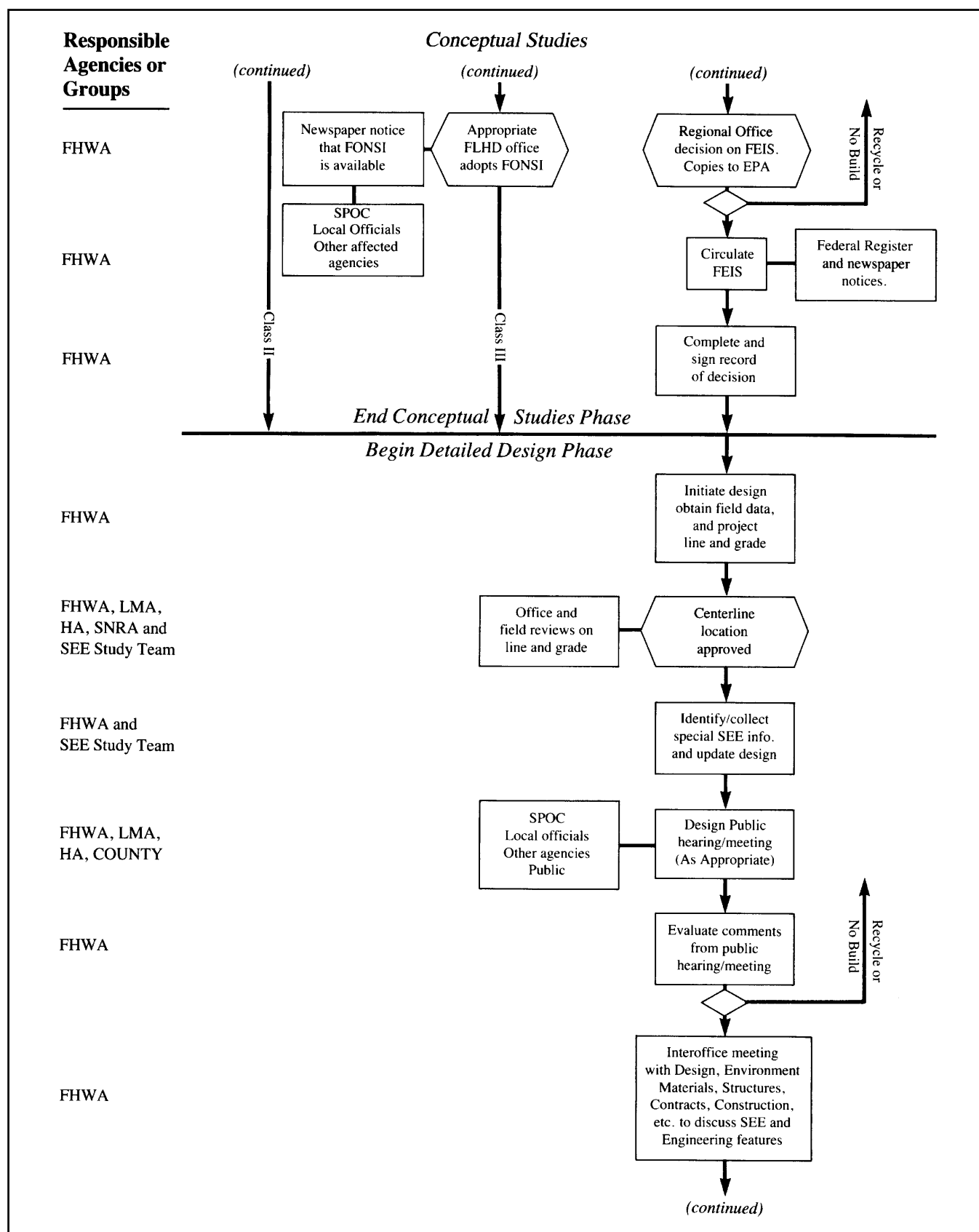


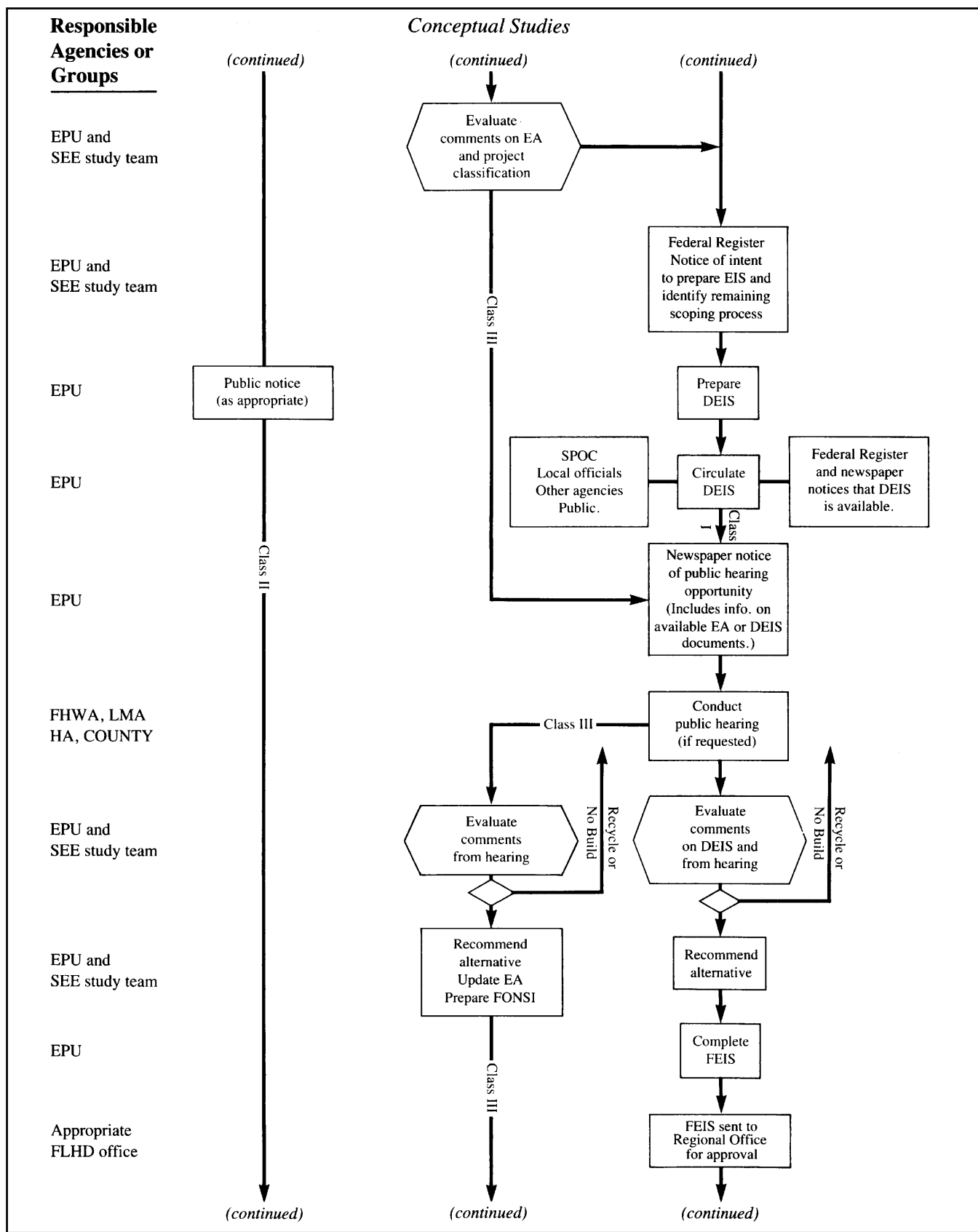
**Exhibit 3.4-C PROJECT DEVELOPMENT PROCESS**  
(Continued)



**Exhibit 3.4-C PROJECT DEVELOPMENT PROCESS**  
(Continued)







**Exhibit 3.4-C PROJECT DEVELOPMENT PROCESS**

(Continued)

Scoping will generally consist of joint meetings with all concerned agencies, but can also be accomplished through appropriate public involvement and other mechanisms (e.g., letters, individual meetings). It is FHWA's responsibility, when acting as lead agency, to evaluate the input from scoping and in coordination with other agencies and the public to determine the scope of the environmental document.

Cooperating and interested agencies (e.g., as the land management agency or the permit agencies) are encouraged to assist in preparing environmental documents in order to maximize the joint efforts, minimize duplication and improve the time frame for project development.

#### **3.4.4 Public Involvement**

Public involvement is an integral part of the environmental, conceptual studies and design processes that ensure adequate opportunity for citizen and/or agency input and an exchange of views.

Highlights of public involvement are as follows:

- agencies, groups or individuals are asked for input and placed on a mailing list;
- outside agencies and interested groups are consulted during the early coordination process;
- public meetings are held during conceptual studies and design phases;
- the environmental document is available for review and comment;
- location/design public hearings are conducted;
- wide exposure is obtained through public notices; and
- cooperating agencies are determined and their involvement is encouraged at this time.

An effective public involvement program can gain public support, assist the project development process through early identification and resolution of issues and remove potential barriers caused by poor dissemination of information.

Public involvement includes the participation of officials of local governments and other State and Federal agencies, citizens, special interest groups, adjacent residences and businesses, community groups, minority groups and any others expressing interest or knowingly affected by a project.

Local governments, which are often active sponsors of proposed projects, can effectively assist in developing and conducting public participation programs. They, along with State and Federal agencies, should be contacted early in the public involvement process, and be kept informed of the project's progress.

Effective public involvement needs to be flexible, innovative and continuous. Many methods can and should be considered.

The following are intended as a source of ideas from which to develop an effective public involvement effort. Each Division office should respond to changes, as appropriate, in order to keep the affected community informed about project actions.

#### **3.4.4.1 Public Meetings**

Meetings are generally more informal and use a less traditional format than hearings. Public meetings range from the large informational and workshop meetings to the small group and one-on-one meetings with individual citizens.

Drop-in centers where the public may leisurely visit to review project displays and interact with FHWA personnel have been very successful in gaining public involvement in a relaxed atmosphere. Small meetings are also very useful for gaining information from special interest and neighborhood groups. Workshop formats, where large groups are organized into small discussion groups, serve to maximize participation while discouraging domination of the meeting by a few individuals. Presentations at regularly scheduled meetings of chambers of commerce, city councils and other interested groups should also be considered. Each Division needs to evaluate what end product is desired from the meeting, then plan accordingly to achieve that product.

Since public meetings or hearings are frequently the Government's principal community exposure, it is important that the person conducting the meeting conveys the people image. For additional information, see the FHWA publication, *Improving the Effectiveness of Public Meetings and Hearings*, 3<sup>rd</sup> ed., 1981.

When the meeting is well-planned and the meeting moderator is sensitive to the needs of the audience and objective about the needs of the project, public meetings are usually productive public involvement efforts.

Public meetings are to be documented in a report that should be sent to all participants, as well as other interested parties, as appropriate.

#### **3.4.4.2 Notification Techniques**

Develop notification techniques to attract a cross section of the public that is interested in the project. Special notices should be provided to those directly affected. All notifications should catch the public's attention and encourage people to attend the meeting or become involved. The following techniques should be considered:

- news releases through TV or newsletters,
- billboard advertisements near project,
- fliers,
- newsletters,
- posters,
- local bulletin board announcements,
- paid advertisements,
- personal contacts,

- radio announcements, and
- on-site tours.

Notices prepared for the public frequently make effective handouts. A well-designed and informative handout can serve as an ongoing link between FHWA and the community.

Handouts have no set format. They should be as clear, relevant, up-to-date and as self-explanatory as possible, and written in a style that is easily understood. Handouts in appropriate foreign languages should be used when necessary. Consider using the following types of handouts when dealing with the public that speaks a language other than English:

- special project newspapers;
- pamphlets, brochures, booklets (for large, complicated projects);
- fliers (for small, simple projects);
- charts, tables, graphs;
- project maps (e.g., aerial photographs or line drawings);
- project development schedules;
- summary project reports;
- right-of-way brochures (or other general information); and
- questionnaires (surveys).

Normally, graphics or visual aids are used to present project information to the public. Clear, attractive and self-explanatory audiovisuals can create a baseline of common interest and understanding. Traveling slide shows or graphic exhibits to inform civic groups, community groups, coffee klatches, local officials, etc., on specific projects have been successfully used. These presentations need to be informal, responsive to questions and concerns and presented by people with the same qualifications as those conducting meetings.

Suggested presentation techniques include the following:

- slides, slide-tape presentations;
- models;
- maps (should be large and simple);
- artist's renderings;
- videotapes;
- photomontages; and
- aerial photograph exhibits.

### **3.4.4.3 Follow-up Procedures**

Even though effective public involvement is ongoing, at significant points in the process, the Division Public Information Officer should follow up public input with general information about the project. Responsive follow-up ensures the public that information gained is appropriately considered in the final decision. Follow-up information needs to convey as accurately as possible how the public's input was used or not used to develop the project.

include newsletters, summary reports, individual contacts or other types of information prepared and disseminated in context with the public's contribution to the project. Follow-up on smaller projects or specific comments may simply be a timely response to individual requests for specific answers or information.

#### 3.4.4.4 Public Hearing Procedures

The statutory requirements for affording the opportunity for public hearings are contained in [23 USC 128](#). At the time this requirement was instituted, public hearings were extremely formal. In the interim, increased emphasis on other involvement mechanisms and major attention to SEE effects have changed the public hearing format. In many cases, a public hearing is structured very differently than in the past. Experience gained in the last several years indicates that a hearing is more effective if it is less formal.

While perhaps the most displayed aspect of an agency's involvement program for certain projects, hearings are only one means of obtaining data on the public's interests, concerns, priorities and perceptions. Consider combining hearings with informal involvement procedures (e.g., open houses or recesses) after the presentations to afford the public the opportunity to review displays and ask one-on-one questions. Holding informal meetings to clarify issues and concerns and to provide prehearing information should be considered in order to reduce misunderstandings and conflicts that might arise at the hearing. The following briefly describes the procedures for public hearings:

1. **Public Hearings.** During the environmental/conceptual studies process, a public hearing must be scheduled or the opportunity offered in order to discuss projects that fall into the following categories:
  - new location;
  - require the acquisition of significant amounts of right-of-way;
  - substantially change the layout or function of connecting roads or streets or of the facility being improved;
  - have a significant adverse impact upon abutting real property or otherwise have a significant social, economic or environmental effect; and/or
  - have been determined by FHWA that the project is in the public interest.

[Exhibit 3.4-D](#) summarizes the application of this hearing criteria by project category. For Class I projects, a public hearing will be scheduled or an opportunity offered for a public hearing. Projects classified as Class II, under [23 CFR 771.117\(d\)](#), may require public hearings or the opportunity for a public hearing offered. On Class III proposed projects, either a public meeting and/or an opportunity for a public hearing is the appropriate action to inform the public and get their input.

*To be provided.*

#### **Exhibit 3.4-D HEARING CRITERIA BY PROJECT CATEGORY**

Public hearings provide a forum for an open exchange of views concerning the need for the project, alternative locations, alternative major design features and the related potential SEE effects. These features most generally can be covered during the conceptual studies phase in project development in a combined corridor and design hearing. However, for a difficult or controversial project, it may be expedient to hold separate corridor and design hearings.

The alternatives presented at each hearing will be developed to comparable levels of detail. The hearings will be held and the comments will be evaluated before final determination of design parameters for an alternative. For example, when a combined hearing is held, some major design features may have been developed. The comments received at the hearing will be considered before either the location or design alternatives are approved.

During a reevaluation of a project, the following criteria for additional hearings or meetings must be considered when there has been any of the following:

- a substantial change in the proposal;
- a substantial unanticipated development in the area affected by the proposal;
- an unusually long lapse of time since the last hearing; and
- significant social, economic or environmental effects identified that were not previously considered at earlier hearings or meetings.

When a substantial amount of right-of-way has already been acquired, alternative locations should be discussed at the hearings/meetings in order to inform the public of the project history; however, the main discussion should center on major design features.

All required hearings should be timed to follow the circulation of the environmental document for the project.

2. **Public Hearing Notices.** Those interested in or affected by proposed projects (e.g., property owners) must be notified of the opportunity for a public hearing and of a scheduled public hearing. At least two notices of the hearing opportunity or the scheduled hearing must be published in newspapers having general circulation in the vicinity of the proposed project, and in any newspaper having substantial circulation in the area concerned (e.g., foreign language and local newspapers).

At the discretion of the Division Engineer, one of the following notice procedures will be followed:

- a. *Publish Notices Twice.* The first notice is published from 30 to 40 days in advance of the deadline for requesting a hearing or of the scheduled hearing. The second notice is published five to 12 days in advance of the deadline for requesting a hearing or of the scheduled hearing.
- b. *Publish Notices Once.* The notices are published for two consecutive weeks, with the notice scheduled to be at least ten days prior to the deadline for requesting a hearing, or of the scheduled hearing.

Each notice shall be sent to appropriate news media; the State's resource, recreation and planning agencies, and appropriate Federal agencies (e.g., Departments of Agriculture, Interior and Housing and Urban Development).

Copies should be sent to local public officials, public advisory groups and agencies who have requested notice of hearing, and other groups or agencies who, by nature of their function, interest or responsibility, are known to be interested in or affected by the proposed project.

Under normal circumstances, each Division maintains a list, which any Federal agency, local public official, public advisory group or agency, civic association or other community group can enroll to receive notices in any area specified by them.

The notice of a hearing opportunity will explain the procedures to use for requesting a hearing and explain that the hearing will either be scheduled or a mutually agreeable meeting will be arranged with those requesting one. The notices also indicate the date, time and place of a scheduled hearing, contain a description of the proposed project and announce the availability of the environmental document. The notices include the procedures for submitting written statements and exhibits at or after the hearing. The public hearing notice indicates that relocation assistance programs, as appropriate, will be discussed at the hearing. Notices for design hearings should also indicate that tentative schedules for right-of-way acquisition and construction will be discussed. Notices also include information (e.g., significant flood plain encroachments) to comply with other applicable laws, executive orders or regulations.

The notice should also specify that maps, drawings and other pertinent information developed by the government and written views received, are available for public inspection and copying. Generally, this inspection will be held at the nearest FHWA,



land management agency or highway agency offices, or at some other convenient location in the vicinity of the project.

Following a public hearing or opportunity for a hearing, a notice is published in the news media concerning the decision made on the final environmental document and/or the action taken on the location, and major design features for Class I and III projects, as well as some Class II projects, as appropriate. See [Exhibit 3.4-E](#) for an example of a typical hearing notice.

3. **Conducting Public Hearings.** Hearings are to be held at a place and time convenient for persons affected by the proposed undertaking and are to be accessible to the disabled. Responsible officials from the highway agency and FHWA or other qualified individuals will be present to conduct the hearings and will respond to questions that arise. The FHWA staff will be available prior to the hearings to receive the public and respond to their questions.

The hearing moderator and participants should be responsive to all reasonable and proper questions. The hearing moderator should control the tone of the hearing and should not allow any person to be harassed or subjected to unreasonable cross-examination.

Formal presentations by the program agencies should be accomplished first, in a reasonable time frame that should last no more than 45 minutes. Questions should not be accepted during this time.

The Federal Highway Administration, together with the Forest Service, Wayne County, Sevier County and the Utah Department of Transportation, will hold a public hearing concerning the reconstruction of a portion of Forest Highway 42. The portion to be reconstructed begins at State Highway 72, about 4.3 km (2.7 mi) northeast of the town of Fremont, then proceeds up the Fremont River valley to Johnson Valley reservoir ending at the recently improved highway on the west side of the reservoir.

The proposed reconstruction will generally follow the existing road. Work will include improving the horizontal and vertical alignment, improving drainage structures, widening the travel lanes to 3.3 m (11 ft) and adding 0.6-m (2-ft) shoulders. The travel lanes and shoulders will be surfaced with a hot asphaltic concrete pavement.

An environmental assessment document has been prepared and is available for examination at the Forest Service offices in Richfield and Loa, at the Utah Department of Transportation district office in Richfield and at the Federal Highway Administration offices in Salt Lake City, Utah and Denver, Colorado. A limited number of copies are available upon request from the Federal Highway Administration address given below. A draft Section 4(f) evaluation report for the 3.2-km (1.97-mi) section of this improvement that lies within the Fish Lake/Johnson Valley Recreation Area has been included.

The proposed improvement will encroach upon the 100-year flood plains of the Fremont River, Sevenmile Creek and UM Creek. The proposal will affect wetlands along the Fremont River and Johnson Valley Reservoir and at the UM Creek and Sevenmile Creek crossings. Corps of Engineers Section 404 permits will be required for the Sevenmile Creek, Fremont River (two), and UM Creek crossings. It is also likely that Section 404 permits will be required at several locations along the Fremont River where riprap will be used to stabilize the bank. Concerns relating to these permits should be expressed at this hearing.

The public hearing will be held on Wednesday, April 2, 1996 beginning at 7 p.m. in the Loa Community Center, Loa, Utah. The hearing is being held to provide an opportunity for citizens to learn more about the proposal and to present oral and written comments.

All written comments that are to be included in the public hearing record must be received at the Federal Highway Administration, PO Box 25246, Denver, Colorado 80225, no later than April 14, 1996.

NOTICE OF PUBLIC HEARING  
For the Improvement of  
Utah Forest Highway 42  
The Fish Lake - Fremont River Road

#### **Exhibit 3.4-E SAMPLE NOTICE FOR A PUBLIC HEARING**

There should be a brief break for the public to view the exhibits and visit with the program agency participants. In addition, the agenda should allow for acceptance of written and/or oral presentations by the public in an orderly manner and in an appropriate time frame.

The moderator may decide to have those wishing to speak sign in as speakers or the moderator may decide to randomly select the speakers from the audience. It may be necessary that the moderator limit each speaker's allowed time to accommodate a large number wanting to speak. A random selection of speakers may be more appropriate for smaller groups.

Speakers should be asked to state their names and who they represent so they can be readily identified with their presentations in the hearing transcript.

Responses by the program agency participants may follow each presentation by the public or may be held until later during a question and answer period.

There should be a question and answer period following the formal presentations by the public. Program agency participants should provide informative responses to questions asked. Should information to respond not be available, a verbal commitment may be made to provide the appropriate information to the questioner when it is available.

Prior to adjourning the hearing, the moderator or Division office participant may summarize the important information received at the hearing and relate which procedures, schedules or actions will follow the review based on the hearing information and comments received on the environmental document.

4. **Public Hearing Agenda.** Public hearings are generally more successful and gain more public participation when an informal agenda is used to learn the public's views and opinions in a casual and personal way.

The hearing agenda and/or presentations should be prepared to do the following:

- Explain the purpose of the hearing, the need for the project and the history of project development, including a synopsis of public and interagency involvement activities.
- Provide an appropriate brochure, pamphlet and the Federal, State and county highway agency relationship in the Federal-aid highway program.
- Provide a method of recording attendance and informing the attendees that anyone wishing to receive written notice of FHWA's action resulting from this environmental hearing process should list their name and mailing address on the sign-in sheet.
- Provide information on all reasonable location alternatives studied, on the no-action alternative and on their significant SEE effects at corridor hearings. At corridor/design hearings, discuss all reasonable location/design alternatives, the no-action alternative and significant SEE effects.

- Present preferred alternatives. However, it should be stressed that the alternatives are subject to reevaluation and/or revision based upon public input at the hearing, additional studies, comments made on the environmental document or other information that may become available.
- Explain, as appropriate, right-of-way acquisition procedures, cost estimates and construction schedules including any critical activities that may involve or affect the public.
- Discuss the relocation assistance program and explain which assistance payments are available. Distribute a relocation assistance brochure, pamphlet or similar type of handout.
- In the event that the project requires no relocation, the relocation assistance discussion may be omitted and a simple statement made that relocation assistance is provided when needed, but that no relocation is required by the project under discussion.
- However, right-of-way personnel should still be in attendance and the relocation assistance handout made available to the public.
- Explain that all information developed in support of the proposed location or design will be available upon request for public inspection and copying.
- The information presented for inspection and copying should be available in the locality of the project. A project office, a state transportation facility, a local government office or other Federal offices are logical and sometimes convenient sites for the presentation of the information.
- Explain the requirements for public submission of written statements and exhibits at or within ten days after a hearing. The procedures for making submissions should be described in the notice and at the hearing.

5. **Documenting Public Hearings.** The following documents must be prepared and made available to interested parties:

- a. *Transcript.* A verbatim written transcript of the oral proceedings, together with copies of all written statements or exhibits used or filed in connection with the hearing assembled into one document. The document shall also contain or reference all information made available to the public before the hearing.
- b. *Certification.* A certification stating that the hearing has been held or that the opportunity for the hearing has been afforded. A further certification is prepared stating that the SEE effects of the proposed project have been considered and, where appropriate, the project is consistent with the goals and objectives of the urban planning as has been set forth by the community.
- c. *Environmental Documents.* Appropriate environmental documents that indicate the consideration given to the social, economic, environmental and other effects

of the plan or highway location or design, and the various alternatives that were raised during the hearing, or which were otherwise considered.

The transcript and all other relevant data assembled is made available for public inspection and copying at the locations listed in the public hearing notice.

After the Division Engineer has selected the design to be constructed, the public should be advised. See [Section 3.4.4.2](#) for effective methods of notification.

### 3.5 APPROVALS

Numerous approvals needed as a proposed project advances through the project development process are addressed in the following Sections.

#### 3.5.1 Actions By Other Agencies

The following list briefly describes various statutes and regulations that require consultation and/or approval actions by other agencies having jurisdictional authority for some aspect of the proposal. Depending on the location of the project and its impact on the surrounding area, additional statutes and regulations may apply.

Many of these actions are common occurrences on most proposals while others are infrequent occurrences. Although some do not require formal approval actions, several regulations have the same time-consuming effect; they involve difficult consultation and agreement on mitigation measures before the environmental document can be completed and the proposed project can be advanced to detailed design.

Environmental legislation requiring consultation, coordination and/or permits, certification, clearance, concurrence or otherwise approvals from other agencies is as follows:

1. **ISTEA.** All Federal Lands Highway Projects are required to be included in an approved State Transportation Improvement Plan (STIP).
2. [\*\*Rivers and Harbors Act of 1899.\*\*](#) The following applies:
  - consult and coordinate with EPA, USACE and USCG,
  - obtain a navigation permit from USCG (see [Section 3.6.2.3](#)), and
  - obtain a fill permit (Section 10) from USACE (see [Section 3.6.2.1](#)).
3. [\*\*Clean Water Act of 1977.\*\*](#) The following applies:
  - consult and coordinate with EPA, USACE and the appropriate State water agency;
  - obtain a Water Quality Certification (Section 401) from the appropriate State water agency; and
  - obtain a fill permit (Section 404) from USACE (see [Section 3.6.2.1](#)).
4. [\*\*Fish and Wildlife Coordination Act of 1958.\*\*](#) The following applies:
  - consult and coordinate with FWS and the appropriate State fish and game authorities, and
  - obtain certification from the appropriate State fish and game authorities pursuant to State Acts.
5. [\*\*Wild and Scenic Rivers Act.\*\*](#) Consult and coordinate with USFS and NPS.

6. [\*\*Clean Air Act of 1970 \(amended 1990\)\*\*](#). FHWA and the appropriate State air agency will determine if the project is consistent with a State implementation plan. Also, consult and coordinate with EPA.
7. [\*\*National Historic Preservation Act of 1966 \(Section 106\) \(amended 1992\)\*\*](#). Consult and coordinate with SHPO and DOI and obtain clearance from SHPO.
8. [\*\*Archeological and Historic Preservation Act of 1974\*\*](#). Consult and coordinate with SHPO and DOI and obtain clearance from SHPO.
9. [\*\*DOT Act of 1966, Section 4\(f\)\*\*](#). Consult and coordinate with HUD, USDA and DOI.
10. [\*\*Land and Water Conservation Fund Act, Section 6\(f\)\*\*](#). Consult, coordinate and obtain approval from DOI if Section 6(f) lands are taken.
11. [\*\*Wilderness Act of 1964\*\*](#). Consult and coordinate with FS, FWS, NPS, BLM and the appropriate State agencies.
12. [\*\*Endangered Species Act of 1973 \(Amended 1978\)\*\*](#). The following applies:
  - see the Memorandum of Understanding between USDA, DOD, USACE, NMFS, DOI, DOT and EPA, dated September 1994; and
  - consult and coordinate with FWS, the appropriate State fish and game authorities and NMFS (marine species only).
13. [\*\*Intergovernmental Cooperation Act of 1968 \(EO 12372\)\*\*](#). Submit notification to the appropriate State's single point of contact.
14. [\*\*Safe Drinking Water Act of 1974\*\*](#). Consult and coordinate with EPA and the appropriate State health agency.
15. [\*\*National Flood Insurance Act of 1968\*\*](#). Consult and coordinate with HUD relative to areas threatened by flood hazard.
16. [\*\*36 CFR Parts 215 and 217\*\*](#). The following applies:
  - procedures for National Forest System Projects and Activities;
  - appeal of Regional Guides and National Forest Land and Resource Management Plans;
  - consult and coordinate with Forest Service; and
  - environmental Justice, Executive Order 12898.
17. [\*\*Evaluation of Flood Hazards, Executive Order 11296\*\*](#). Consult and coordinate with USACE.
18. [\*\*Protection of Flood Plains, Executive Order 11988\*\*](#). Consult and coordinate with USACE and FEMA.

19. [\*\*Migratory Bird Conservation Act\*\*](#). Consult and coordinate with DOI and the appropriate State agencies relative to sanctuaries or wildlife areas.
20. [\*\*Anadromous Fish Conservation Act\*\*](#). Consult and coordinate with FWS, NMFS and the appropriate State fish and game authorities.
21. **Protection of American Antiquities (Monuments and Memorials)**. Consult and coordinate with NPS and the appropriate land management agency.
22. **National Park Service General Authorities Act of 1970**: The following applies:
  - Section 8, National Natural Landmarks; and
  - coordination with NPS.
23. [\*\*Protection of Wetlands, Executive Order 11990\*\*](#). Consult and coordinate with FWS, USACE and the appropriate State fish and game authorities.
24. [\*\*National Trails System Act\*\*](#). Consult and coordinate with NPS and FS.
25. [\*\*Highway Improvements in the Vicinity of Airports \(23 CFR 620, Subpart A\)\*\*](#). Submit design to FAA for approval.
26. [\*\*Farmland Protection Policy Act of 1981 \(7 CFR 658\)\*\*](#). Coordinate with SCS.
27. [\*\*Coastal Zone Management Act of 1972 \(15 CFR 923 and 930\)\*\*](#). Coordinate with the appropriate State Coastal Zone Management Agency and the US Department of Commerce (OCZM).

When applicable, the following actions must occur during the environmental analysis and be documented in the environmental report prior to its completion and approval:

- make a floodplain/wetland determination,
- make a clean air consistency determination,
- obtain a cultural resource clearance,
- perform an endangered species biological analysis, and
- make an airport/highway conflict determination.

Although coordination for action is initiated early in the environmental analysis, the following actions are to be undertaken during the detailed design phase following approval of the environmental report:

- obtain a fill permit,
- obtain a navigational permit,
- obtain a water quality certification,
- obtain a streambed alteration certification (pursuant to some State Acts),
- obtain State and/or local permits for material sources,
- obtain FAA approval of highway design in vicinity of airports,
- obtain NPDES permit,
- obtain State permits for sediment and erosion control during construction,



- obtain State permit for stormwater management,
- obtain State permit for wetland encroachment, and
- obtain State permit for upland mitigation.

### 3.5.2 Actions by Federal Highway Administration

The environmental process involves numerous approval actions, in consultation with land management agencies, during the conceptual studies stage at various levels of authority in FHWA. See [Exhibit 3.5-A](#).

Action	FHWA Authority
Initial project classification	Action Plan Committee
Final project classification	Action Plan Committee
CE	Division Engineer
FONSI	Division Engineer
Draft EIS	Division Engineer
Final EIS	FHWA Regional Office
Section 4(f) Statement	FHWA Regional Office
ROD	FHWA Regional Office

*Notes:*

1. *This Exhibit is applicable when FHWA is the lead agency.*
2. *Approval of the CE, FONSI or ROD constitutes approval of the general highway location and to begin detailed design.*
3. *Final EIS approval may require prior concurrence of FHWA Headquarters.*

### Exhibit 3.5-A APPROVAL ACTIONS

### 3.6 REPORTING

The environmental document formally reports the process of collecting, researching, summarizing and analyzing the facts concerning alternatives, focusing on the important impacts and issues.

Underlying scientific theory, assumptions, rationale and findings presented in the environmental document should be clear, concise and to the point. They should be supported by visual aids and evidence that the necessary analyses have been made and understood by the reviewer.

#### 3.6.1 Environmental Documents

The SEE Study Team and the environmental planning engineers should consider for inclusion in the appropriate environmental report the following:

- the important engineering and SEE aspects of the proposed project,
- the effects of no-build, and
- reasonable engineering alternatives and measures to minimize adverse impacts.

The environmental document promotes the policies and goals of NEPA and other environmental statutes in Federal programs and actions.

The engineering information and descriptions of the improvement alternatives contained in the environmental documents are summarized from the conceptual study reports. (See [Section 4.6.2.](#)) Dual units (i.e., metric and US Customary) should be used for all documents that are subjected to public review and comment. Since the final location approval decisions are a product of the environmental process, it is imperative that environmental documents present the engineering data in an accurate, complete and understandable fashion.

FHWA concurs with the CEQ philosophy that the goal of the NEPA process is better decisions. The length of an environmental assessment should range from ten to 15 pages and the length of an Environmental Impact Statement should not normally exceed 150 pages.

The environmental documents are described as follows:

1. **Environmental Assessment (EA).** A public document developed by a Federal agency to provide evidence and supporting analysis for determining whether there is a significant impact and if there is a need to prepare an EIS or a FONSI. An EA is also used to substantiate compliance with NEPA when no EIS statement is necessary.

This document should include discussions of the need for the proposed project, of the environmental impacts of the preferred action, no-build and other reasonable alternatives, and a listing of agencies and persons consulted.

2. **Finding of No Significant Impact (FONSI).** A document by a Federal agency briefly presenting the reasons why an action, not otherwise excluded, will not have a significant effect on the human environment and that therefore an EIS will not be prepared. The

FONSI includes the EA or a summary of it and notes any other environmental documents related to it. If the EA is included, the FONSI need not repeat any of the discussion in the EA but may incorporate it by reference.

3. **Environmental Impact Statement (EIS).** A detailed, written statement containing an assessment of the anticipated significant, beneficial and/or detrimental effects that a proposed major FHWA action, no-build or other alternatives may have upon the quality of the human environment.
4. **Record of Decision (ROD).** A decision document that follows the final EIS and sets forth the reasons for the project decision, based on material in the EIS. While cross referencing and incorporation by reference of material in the final EIS or other documents is appropriate, the ROD completely and clearly explains the basis for the project decision.
5. **Categorical Exclusion (CE).** A statement on an action that does not individually or cumulatively have a significant effect on the human environment and has no effect on procedures adopted by a Federal agency in implementing the CEQ regulations. Neither an EA nor an EIS is required. Examples of projects complying with these regulations are specific highway improvement projects (e.g., resurfacing, reconstruction and widening existing lanes, adding auxiliary lanes).

Although CE proposals do not require a formal environmental document pursuant to NEPA, coordination and documentation is still required for other applicable environmental statutes and regulations.

6. **Section 4(f) Evaluations/Approvals.** The FHWA Technical Advisory T 6640.8A provides detailed information on format and content requirements for documenting and reporting evaluations or approvals on projects proposing to use Section 4(f) lands.

A no-build decision and each reasonable engineering alternative that uses Section 4(f) lands should be addressed. For a complex 4(f) involvement, include the analysis in a separate part of the EIS, EA or FONSI document. For projects processed as a CE, the evaluations or determinations may be in a separate document.

The Section 4(f) approval is incorporated into the final EIS, ROD or FONSI document. For projects processed as a CE, the approvals should be in a separate document.

### 3.6.2 Permits/Clearance Documentation

As discussed in [Section 3.5](#) and in other [Chapters](#), numerous permits/clearances or other similar actions or documentation are required before projects may be advanced to construction.

#### 3.6.2.1 Fill Permits pursuant to Section 404

During USACE review of Section 404, fill permit applications pursuant to the [Clean Water Act](#), USACE will consider earlier public meetings or hearings and consultations with the Water Quality and Natural Resource agencies and the Fish and Wildlife Service.

Satisfactory processing of fill permit applications is dependent upon a well written environmental report, use of procedures detailed in the FHWA/USACE Memorandum of Agreement and the providing of evidence of public and interagency involvement.

The environmental report should give the general location of fill activity, approximate quantities of fill material, general construction grades, proposed mitigation measures and evidence of public and interagency involvement.

The application to the USACE for a fill permit generally occurs during the design phase of the proposal and uses Standard Form 4345. The proposed fill activity, its purpose and intended use must be described in detail. A sample of an application form is shown in [Exhibit 3.6-A](#).

General or Nationwide permits are issued by USACE for any category of activity on a State, regional or national basis if the activities are similar in nature and will cause only minimal adverse environmental effects when performed separately and will have only minimal cumulative adverse environmental effects.

### **3.6.2.2 Other Clearances (Sections 401 and 402 of *Clean Water Act*)**

Certifications are required from the State water quality agency pursuant to Sections 401 (water quality) and 402 (point discharges) of the [Clean Water Act](#). Consultation with the Environmental Protection Agency concerning point discharges is also required. National Pollution Discharge Elimination System (NPDES) permits are also required for many projects.

Modifications of streambeds may also require a permit from the State natural resources agency pursuant to State statutes.

These actions are byproducts of the USACE and US Coast Guard permit procedures.

### **3.6.2.3 Navigation Permit (Section 10 of the *Rivers and Harbors Act of 1899*)**

USACE permits are required whenever proposed projects involve building any obstruction in navigable waters or waters subject to tidal influence. US Coast Guard permits are required under Section 9 of the [Rivers and Harbors Act of 1899](#) and Section 502(b) of the [General Bridge Act of 1946](#).

The USACE, Fish and Wildlife Service and the appropriate State water quality and natural resource agencies are also involved because Sections 401, 402 and 404 of the [Clean Water Act](#) and State streambed alteration statutes are applicable.

<b>APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT</b> <i>(33 CFR 325)</i>	<b>OMB APPROVAL NO. 0702-0036</b> <b>Expires 30 June 1992</b>
Public reporting burden for this collection of information is estimated to average 5 hours per response for the majority of cases, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Applications for larger or more complex projects, or those in ecologically sensitive areas, will take longer. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington DC 20503.	
The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act and Section 103 of the Marine, Protection, Research and Sanctuaries Act. These laws require permits authorizing activities in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided on this form will be used in evaluating the application for a permit. Information in this application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.	
One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see <i>sample drawings and instructions</i> ) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.	
1. APPLICATION NUMBER <i>(To be assigned by Corps)</i>   2. NAME AND ADDRESS OF APPLICANT    Telephone no. during business hours A/C ( ) _____ (Residence) A/C ( ) _____ (Office)	3. NAME, ADDRESS, AND TITLE OF AUTHORIZED AGENT   Telephone no. during business hours A/C ( ) _____ (Residence) A/C ( ) _____ (Office)  <b>Statement of Authorization:</b> I hereby designate and authorize _____ _____ to act in my behalf as my agent in the processing of this permit application and to furnish, upon request, supplemental information in support of the application.  <div style="display: flex; justify-content: space-between;"> <span><b>SIGNATURE</b></span> <span><b>DATE</b></span> </div>
4. DETAILED DESCRIPTION OF PROPOSED ACTIVITY	
4a. ACTIVITY	
4b. PURPOSE	
4c. DISCHARGE OF DREDGED OR FILL MATERIAL	

ENG FORM 4345, Aug 89

EDITION OF APR 86 IS OBSOLETE

(Proponent: CECW-ON)

**EXHIBIT 3.6-A****APPLICATION FOR A USACE FILL PERMIT**

5. NAMES AND ADDRESSES OF ADJOINING PROPERTY OWNERS, LESSEES, ETC., WHOSE PROPERTY ALSO ADJOINS THE WATERWAY					
6. WATERBODY AND LOCATION ON WATERBODY WHERE ACTIVITY EXISTS OR IS PROPOSED					
7. LOCATION ON LAND WHERE ACTIVITY EXISTS OR IS PROPOSED					
ADDRESS:					
_____					
STREET, ROAD, ROUTE OR OTHER DESCRIPTIVE LOCATION					
_____					
COUNTY	STATE	ZIP CODE			
_____					
LOCAL GOVERNING BODY WITH JURISDICTION OVERSITE					
8. Is any portion of the activity for which authorization is sought now complete?                      YES                      NO If answer is "yes" give reasons, month and year the activity was completed. Indicate the existing work on the drawings.					
9. List all approvals or certificates and denials received from other federal, interstate, state or local agencies for any structures, construction, discharges or other activities described in this application.					
ISSUING AGENCY	TYPE APPROVAL	IDENTIFICATION NO.	DATE OF APPLICATION	DATE OF APPROVAL	DATE OF DENIAL
10. Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities or I am acting as the duly authorized agent of the applicant.					
SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE		
<i>The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 3 has been filled out and signed.</i>					
18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than five years, or both.					

(Reverse of ENG FORM 4345)

U.S. GOVERNMENT PRINTING OFFICE: 1989 0--941-358

**Exhibit 3.6-A APPLICATION FOR A USACE FILL PERMIT**  
(Continued)

Consultation is similar to [Section 3.6.2.1](#), but with US Coast Guard and other waterway agencies involved. Specific responsibilities are included in the FHWA/US Coast Guard Memorandum of Understanding. Should a proposal affect a historic bridge that is eligible for the National Register of Historic Places, coordination with the US Coast Guard is necessary to ensure they will accept the environmental document and/or programmatic Section 4(f) approach.

The navigational and engineering needs, environmental resources and effects and mitigation measures should be discussed and agreed upon and documented in the appropriate FHWA environmental report. There may be instances where the US Coast Guard will process a FHWA Categorical Exclusion with a US Coast Guard FONSI.

### 3.6.2.4 Cultural Resource Clearance

Studies and consultations concerning cultural resources are performed together with alternative studies and other environmental aspects to minimize or mitigate the effects of proposed projects and ensure timely clearance. Consider the following:

1. **Cultural Resource Analyses.** The following applies:
  - consult with the SHPO, historical societies and groups and management agencies;
  - conduct historical/archeological surveys;
  - identify properties included in or eligible for inclusion in the National Register of Historic Places; and
  - evaluate the effect of the proposed action.
2. **Documentation in the EA or draft EIS.** The following applies:
  - resources and survey information;
  - coordination with SHPO;
  - determination of effect on eligible sites by FHWA;
  - proposed mitigation measures (e.g., avoidance, data recovery); and
  - unresolved issues.
3. **Documentation in the FONSI or Final EIS.** The following applies:
  - coordination with the SHPO;
  - coordination with the Advisory Council on Historic Preservation (ACHP), if there is an effect;
  - determination of no adverse effect (with or without conditions);
  - Memorandum of Agreement with the ACHP/FHWA/SHPO, if there is an adverse effect; and

- unresolved issues.

Some Categorical Exclusion projects may involve cultural resources that will be documented in the project files.

### **3.6.2.5 Airport Clearance**

Reconstruction or relocation of any highway located within a 3.2-km (2-mi) radius of an airport facility shall be coordinated with the appropriate FAA authority to ensure that airway-highway clearances are adequate for the safe movement of air and highway traffic. See [23 CFR 620 Subpart A](#) and FHPM 6-1-1-2.

### **3.6.2.6 Other Approvals and/or Certifications**

If a proposed project is located within a coastal management zone, a consistency statement concerning the local coastal zone management program may be required by the FLH Division Engineer.

Plans for the construction, operation or maintenance of any structure affecting navigation or flood control in or around the Tennessee River and its tributaries must be approved by the Tennessee Valley Authority (TVA) pursuant to Section 26a of the *Tennessee Valley Authority Act*. The TVA may require an EA before approving the proposed project.

### **3.6.2.7 Standard Forms**

Standard forms are sometimes used by other agencies in order to obtain data needed to apply for a permit or clearance for the portion of a project for which they are responsible.

The most recurring use of a standard form is for applications to USACE for a fill permit. (See [Exhibit 3.6-A](#).)



### **3.7 DIVISION PROCEDURES**

Reserved for Federal Lands Highway Division office use in supplementing the policy and guidelines set forth in this Chapter with appropriate Division procedures and directions.

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# CHAPTER 4

## CONCEPTUAL STUDIES

### 4.1 GENERAL

The formal project development process begins with a conceptual studies phase. The conceptual studies phase identifies and evaluates alternative courses of action (i.e., engineering concepts) to address the highway's transportation needs and deficiencies. This phase advances a project listed in the multi-year program to a point where it is sufficiently described, defined and located to allow the actual design phase to begin. Conceptual studies are closely related to the environmental process outlined in [Chapter 3](#). The environmental reports normally summarize the engineering results of the conceptual studies.

The overall objectives of the conceptual studies are as follows:

- to fully identify and quantify a highway's transportation needs and deficiencies,
- to develop a general course of corrective action, and
- to identify and evaluate with engineering analyses the feasible and reasonable solutions (alternatives) to these needs and deficiencies.

A preferred alternative is selected after the options have been jointly evaluated in the environmental phase. Assuming the preferred solution involves some form of highway upgrading, the conceptual study phase concludes with the selection of a preferred alternative with the scope of work defined by a category of improvement, geographical corridor and preliminary highway design standards. The formal identification of the preferred alternative occurs in the final approved environmental document and this constitutes location approval.

## 4.2 GUIDANCE AND REFERENCES

The regulations, policies, guides and references that provide the background for implementing conceptual studies are listed in [Section 1.2](#).

For additional references on specific subjects, refer to the guidance and reference section in the appropriate [Chapters](#) of this *Manual*. The listings are not all inclusive and other documents may contain useful information in special situations.

## **4.3 INFORMATION GATHERING**

Data collection is an integral step in the conceptual study process. The following subjects are the most common areas where comprehensive information must be gathered for highway location analysis.

### **4.3.1 Needs Studies (Planning Reports and Inventories)**

These documents provide system-wide highway information on the physical condition, current deficiencies and future needs of routes on a system. General types of needed improvements and approximate construction cost estimates are also reported and can be used to develop a priority list of projects.

While this information is primarily used to show revenue needs or assists the priority setting/programming process, it can provide a good starting database for conceptual studies. Usually, needs studies are general in nature and must be expanded and refined into specific project data, issues and details.

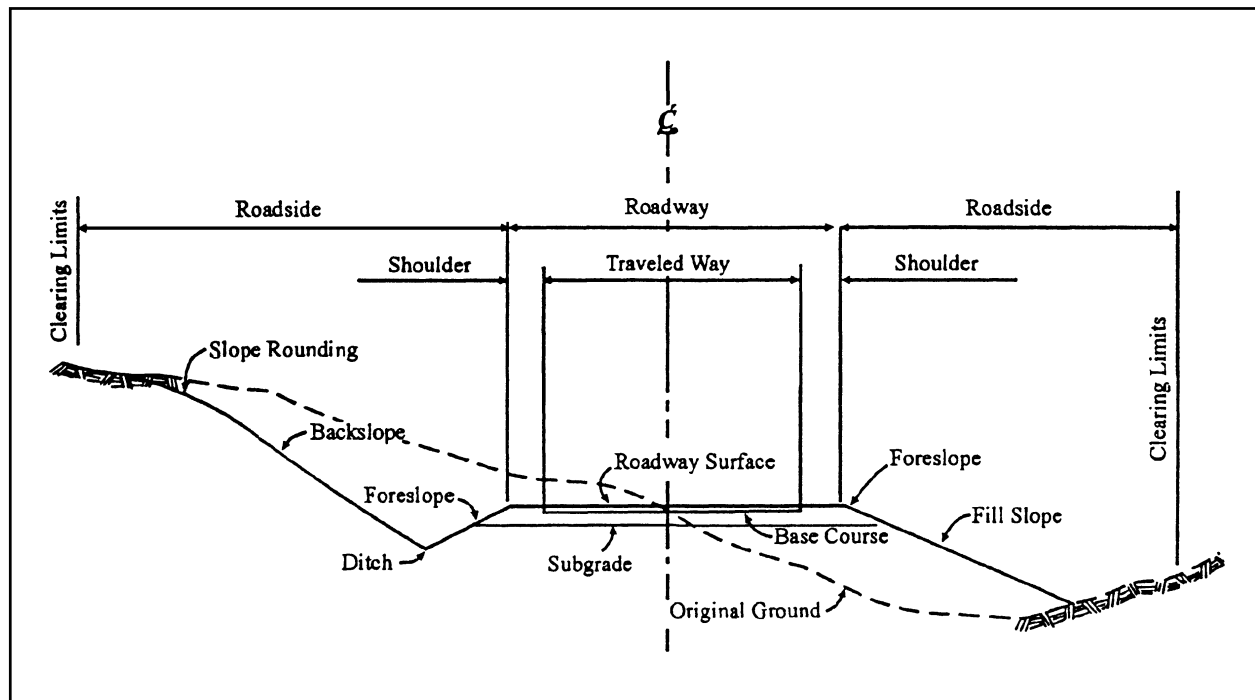
The NPS "Road Inventory and Needs Study" and the 1983 "Forest Highway Inventory and Improvement Study" are examples of studies conducted by FHWA's Federal Lands Highway Divisions. Federal-Aid Divisions and State transportation agencies routinely conduct other needs studies, which may be useful on Federal Lands Highway projects.

### **4.3.2 General Design Criteria**

General design criteria are used to describe and evaluate highway improvement alternatives in conventional engineering terms, so that a highway's physical, structural, safety and operational characteristics can be readily understood. While many elements of design (e.g., stopping sight distance, grades, horizontal/vertical alignment, superelevation) must be established to conduct a detailed highway design, only a few elements are essential at the conceptual stage. Roadway width (i.e., lanes, shoulders), design speed, surfacing type and corridor location are the main criteria for studying highway alternatives. Other features (e.g., side slopes, ditch widths, clearing limits) should also be identified if the total width of project disturbance appears to be a critical consideration. (See [Exhibit 4.3-A](#).)

### **4.3.3 Traffic Characteristics**

Traffic plays a major role in establishing the concept and design of a highway. Traffic indicates the type of service for which the improvement is being made and directly affects the geometric features of design (e.g., widths, alignment, grades).



**Exhibit 4.3-A TYPICAL ROAD CROSS SECTION ELEMENT**

General traffic data (e.g., average daily traffic, vehicle classification) is collected on almost a continuous basis by most highway departments and some land management agencies. This information can be readily obtained and provides a benchmark for traffic data in the study area. When traffic data is not present, it must be developed by special counts or by calculating the number of vehicles from related information (e.g., National Park visitations, cubic meters (feet) of timber hauled, recreational visitor days).

The AASHTO *Green Book* in Chapter 2, *Traffic Characteristics* provides an excellent description of traffic characteristics (e.g., volume, directional distribution, composition of traffic projections, speeds). While much of this information has a more direct bearing on design details, conceptual studies and associated alternative analyses are also dependent on overall traffic data. Sometimes traffic data (e.g., operating speeds, travel time and delay, occupancy rates) are needed to address a special issue. If this data is unavailable, traffic studies as described in ITE's *Transportation and Traffic Engineering Handbook* should be conducted to provide this information.

#### **4.3.4 Crash Data**

Vehicular crash data can provide excellent guidance in determining a road's past problems. These statistics are usually maintained and readily available at the highway department, land



management agency and/or the law enforcement office responsible for that highway facility. When this type of data is not immediately available, a short-term avoidance study or an assessment of crash potential should be conducted.

Figures for crash rates are currently shown in crashes per million vehicle kilometers (miles) traveled. Figures for fatality rates are currently shown in fatalities per one hundred million vehicle kilometers (miles). FHWA plans to keep this figure for at least several more years, but will supplement it with fatalities per one hundred million vehicle kilometers (miles) beginning with FHWA's 1994 *Highway Statistics Report*. [Chapter 8](#) describes in detail how crash rates fit into the safety analyses of highways.

#### **4.3.5 Environmental Considerations**

A highway has wide-ranging effects beyond that of providing traffic service to its users. It is essential that the highway be considered as an element of the total environment. The highway can and should be located and designed to complement its environment and serve as a catalyst to environmental improvement.

Conceptual studies are conducted concurrently with the environmental process and each has a major effect on the other. As outlined in [Chapter 3](#), close coordination is important to ensure the range of improvement alternatives is established in recognition of overall environmental factors. This allows for an orderly, complete evaluation when determining the preferred improvement alternative. Also, design of the preferred alternative must reflect the mitigation commitments identified in the environmental phase.

#### **4.3.6 Reconnaissance Study**

The reconnaissance study or survey is a traditional term given to the engineering process now called conceptual studies. Originally, it was associated more with the investigation and evaluation of road corridors on new alignment. In contemporary terms, the field inspections and engineering involved with identifying and quantifying a highway's deficiencies and needs, developing a course of action with improvement alternatives and conducting engineering analyses that result in a preferred alternative are collectively called a reconnaissance study. Project planning study, route study, feasibility study and preliminary engineering study are all terms used by different agencies and offices to mean some form of reconnaissance activity that falls within the conceptual study phase.

#### **4.3.7 Aerial Photography and Mapping**

Aerial photography and mapping, as described in Chapter 5, [Sections 5.3](#) and [5.4](#), generally provide very valuable and essential data in the study and illustration of highways, roadside features and proposed highway improvements. Detail maps and sometimes mosaic photo composites developed specifically for the highway in the study area are needed in the conceptual study stages when improvements include new corridors or substantial widening,

and/or curve flattening. USGS quadrangle maps or aerial photographs from other agencies can be obtained that suffice or assist in the conceptual studies, especially when more minor improvements are being investigated.

Oblique and terrestrial photography can be helpful in studying proposed improvement corridors and can be enhanced by photomontage techniques to illustrate future highway improvements. These techniques require a preliminary design (e.g., cross section, earthwork), which can be a time-consuming and labor-intensive program.

#### **4.3.8 Geotechnical Reconnaissance**

Preliminary geotechnical information should be obtained early in the conceptual studies phase by specialists in this field of engineering. This will assist in determining the cause for instability or pavement problems on the existing highway and provide information on potential problems for constructing the alternatives under consideration. Subsurface investigations in the study area may be required if existing information is inadequate and/or incomplete.

Typically, a geotechnical reconnaissance report addresses the following:

- geology of the study area;
- existing and/or potential unstable soil conditions;
- location of possible sources or sites for base, surfacing and topsoil materials; and
- estimated surfacing requirements.

More in-depth investigations are conducted later in the project development process as described in Chapter 6, [Section 6.3](#).

#### **4.3.9 Hydraulic Information**

Where water resources affect the road corridor (e.g., flood plains, erosion, drainage, water quality), hydraulic information should be obtained for the conceptual studies stage by specialists. This data aids in determining the cause of some road problems and, more importantly, provides guidance to determine feasibility, location or size of hydraulic structures for the alternatives under consideration. This data is needed more to address environmental concerns and establish a datum than to resolve engineering design problems, which are addressed in the design phase. See [Chapter 7](#) for obtaining detailed information about hydraulic data and procedures.

#### **4.3.10 Public Involvement**

Public involvement is a formal environmental process requirement. It provides necessary input and benefit during conceptual studies. As outlined in Chapter 3, [Section 3.4](#), it is important to publicly announce the beginning of the conceptual studies phase, especially for the larger scale projects. This can help in identifying the local perspective on the major highway problems and

driving difficulties along the route. Once alternatives have been developed, public input can be obtained through the environmental review process for the proposed improvement alternatives and their respective scopes of work.

## 4.4 LOCATION ANALYSIS

The location analysis combines preliminary investigations by nearly all the transportation engineering disciplines (e.g., traffic engineering, survey/mapping, geotechnical, hydraulics, structural engineering, roadway design) into a coordinated comprehensive assessment of a highway's transportation problems and a feasibility study of possible solutions. The analyses involve evaluating diverse field data, yet the analyses are preliminary or general in nature. A higher degree of technical detail is necessary in the design phase.

The types and sequence of steps in the conceptual study process are described in the following subsections. The technical analyses are not always presented in depth, but references are given to the other [Chapters](#) where the preliminary and detail design requirements are discussed.

### 4.4.1 Course of Action

Depending on the degree of investigation and analysis in the planning phase, a project's proposed course of action, as it enters the conceptual study stage, could vary greatly, from a simple description of study area limits to a specific course of action (e.g., replacement of a particular bridge). To fully develop a complete, specific course of action, the overall highway deficiencies and transportation needs must be well identified, quantified and evaluated in the conceptual studies.

The first step is data collection. This consists of an inventory of the physical features and operational characteristics of the existing highway. Most of this information is available from the highway agencies (e.g., highway departments, Federal land management agencies), road monitoring reports and planning/reconnaissance studies. The designer should determine and verify with field inspections the road's length, width, surfacing type, traffic control devices and roadside features along with their current condition. In addition, the road's maintenance condition and recurrent problems are important and should be documented. Also, general traffic data and operational characteristics including seasonal variations, peak use, vehicle types and their volume percentages should be obtained. Travel information like running speeds, congestion periods or any irregularities should be determined. Typically, the maintenance forces have many observations to offer. The quantity of other road users (e.g., bicyclists, pedestrians) must also be established.

Do not overlook winter driving conditions including problems of removing snow and ice. Rural farming areas may also present unique problems of moving farm machinery on the highway.

The current traffic crash statistics for the route should be obtained. This must be supplemented with field identification of potential crash sites that may not be discernible from the past data.

After gathering the data, compare the existing road and its current functional classification, geometric standards, physical condition and present travel demand with the highway agency's road standards. If the highway agency has separate RRR geometric standards and design procedures, determine if they apply to the project. AASHTO's *Green Book's* geometric

standards are broad enough to address most types of roads if there are no other standards that apply. A listing of the road's current deficiencies, both physical and operational, and relative importance of each should be prepared to indicate where the road is substandard and not functioning properly. Exercise care when determining the major contributing factors of a defective road facility. Do not automatically assume an existing substandard road feature is the problem.

Next, the long-term needs of the highway and its users must be determined. This is based on projections of how land use activities in an area are going to change along with their associated transportation requirements. Long-term transportation needs are commonly described by a forecasted 20-year ADT and percentages of vehicle types (e.g., trucks, buses, recreational vehicles), in the travel stream. Other factors like urbanization of the roadside and functional classification changes also directly affect future needs.

The land management agencies through their planning offices and area-wide comprehensive planning documents (e.g., NPS General Management Plan, NPS Development Concept Plans, NFS Forest and Resources Management Plans) can provide some information and assistance in determining future travel demands on highways. Comparing the current highway facility with the geometric standards of a road that is sized to accommodate its future traffic volumes and travel conditions will usually indicate the extent of upgrading that may be warranted to address the long-range transportation needs.

To establish a proposed course of action, one must recognize the existing road, its deficiencies and future needs, the user needs, the context of the facility, and then describe the type of improvement required to create a highway that meets objectives. The objectives are typically to provide a facility to the highway user that fulfills the following:

- fulfills the operational and safety needs of the users,
- meets the convenience and safety standards for that system of highways,
- is cost-effective to build,
- avoids or minimizes environmental impacts, and
- minimizes maintenance costs.

A typical course of action addresses the road's width, alignment, surfacing, major structures, roadside features, and the general types of construction items needed to implement these improvements. Example 4.4-1 provides a sample of a typical course of action.

#### **Example 4.4-1**

Route 1 is to be upgraded between A and B by widening to provide two continuous traffic lanes and shoulders. The horizontal and vertical alignment will also be flattened and corrected to provide a uniform design speed. The road will be stabilized, paved and delineated with standard traffic control devices. The bridge over Clear Creek at Kilometer (Mile) 198 will be replaced. The principal

items of work consist of clearing, grading, drainage, base, asphalt surfacing, signing, striping and bridge construction.

The intent is to describe the type of proposed improvements, but allow flexibility so various alternatives can be considered that will accomplish the proposed course of action.

#### **4.4.2 Alternatives**

Once the proposed course of action is established, the next step is to identify all reasonable alternatives that can accomplish the objectives. These should be practical engineering solutions to the identified problems (e.g., current deficiencies, future needs) within the overall limits of the course of action.

Initially, alternatives might cover quite a range or scale of improvements, but they should be condensed to three or four succinct alternatives for which further engineering analyses can be applied. Otherwise, the details, data and description become very cumbersome to handle. The basic categories of alternatives to be considered on most road upgrading are described in the following Sections.

##### **4.4.2.1 No Action**

The no-action alternative would only continue the routine maintenance of the facility and does not include any upgrading that would change the road's operation or extend its service life.

##### **4.4.2.2 Transportation System Management (TSM)**

This alternative should always be considered when upgrading a road. It consists of travel controls and/or limited construction to maximize the operation and efficiency of the existing facility without major reconstruction or new construction. Sometimes these controls might include one of the following:

- accommodating the existing traffic on other routes or with different types of vehicles;
- posting vehicle restrictions and load limits; and
- providing an alternate, more attractive mode of transportation.

This form of TSM alternative is only marginally effective for Federal Lands Highway Programs because of the outdated, rural highway systems and automobile dependency present in most FLHP situations.

Resurfacing, restoration or rehabilitation (RRR) projects are TSM alternatives with limited construction efforts that can be very cost-effective. The objective is to preserve and extend the service life of the existing highway and enhance safety without substantial costs, construction impacts or major right-of-way acquisitions. Generally, RRR projects are not reconstructed to full geometric standards.

RRR work is undertaken to preserve and extend the service life of an existing highway and enhance highway safety. This may include placement of additional base and surface material and/or other work necessary to return an existing roadway to a condition of structural or functional adequacy. The RRR work is generally done on existing alignment. This salvages a substantial amount of the existing surfacing, but may include some upgrading of geometric features (e.g., minor roadway widening, flattening curves, improving sight distances).

RRR projects are customized for individual situations and often result in exceptions to conventional standards. The improvements, whether only at spot locations or continuous, should acceptably meet existing and preferably future (i.e., 10 to 20 years) traffic needs and conditions in a manner conducive to safety, durability and economy of maintenance. Usually, the RRR project only addresses the most critical deficiencies of the highway so the resultant condition will still have some problem areas/substandard features that would be addressed as part of a future reconstruction. The agency with jurisdiction of the road may have separate design standards and procedures that apply to RRR projects.

Substandard geometric design elements require approval as design exceptions (see [Chapter 9](#)).

#### **4.4.2.3 Reconstruction**

This is an improvement alternative that rebuilds a highway essentially along the same alignment and when the retention of the pavement structure is not a primary objective.

Reconstruction work normally involves a substantial construction effort to rebuild the existing highway to at or near full geometric/safety standards.

The complete spectrum of design deficiencies and functional obsolescence of the roadway, as well as future transportation needs, should be addressed by this level of upgrading. Typical work includes widening, realignment and replacement of bridges. While reconstruction, by nature, follows an existing road corridor, it may deviate significantly in width and alignment from the present road to obtain its full geometric standards.

#### **4.4.2.4 New Construction**

This is an improvement alternative to build a road and/or bridge on completely new alignment or substantially upgrade a highway facility along an existing alignment providing new access to or through an area.

Usually, the highway is built on new alignment in a virgin corridor. It normally is constructed to full geometric standards to fulfill both the current as well as long-term transportation needs of the area.

### 4.4.3 Preliminary Design Standards

Proposed highway improvement alternatives are principally described by preliminary design standards. The design standards listed in *FLHM* 3-C-1 can be supplemented or substituted with approved highway design standards from owner agencies. These substitutions must be consistent with the highway program legislation, regulations and interagency agreements discussed in Chapter 2, [Section 2.3](#) and [2.4](#).

While the categories of alternatives indicate the overall level of upgrading, more specific terms must be used to describe an alternative beyond the general course of action to evaluate its operational, safety and structural characteristics. The roadway width, design speed and surface type are the main elements of the general design criteria used to describe an alternative's preliminary design standards. Other elements (e.g., full typical roadway cross section, preliminary line and grade, grading/clearing limits, auxiliary lanes/tapers, right-of-way widths) are sometimes included when the environmental analysis requires more specific information to evaluate roadside impacts.

The intent of conceptual studies is not to develop the design of the project, but to provide direction and scale of the improvement. Given this direction, the designer should develop the most cost-effective design of the preferred alternative.

A good conceptual study should do the following:

- identify, evaluate and compare benefits and impacts of each alternative;
- establish design flexibility;
- define commitments to protect and preserve the environment; and
- provide long-term planning guidance.

Preliminary concept studies define the project by line and grade, right-of-way limits, construction quantities and roadway geometrics in general terms based on projected traffic volumes, terrain and other special features. During the design phase of the project, these activities will be addressed in more specific detail (see [Chapter 9](#)).

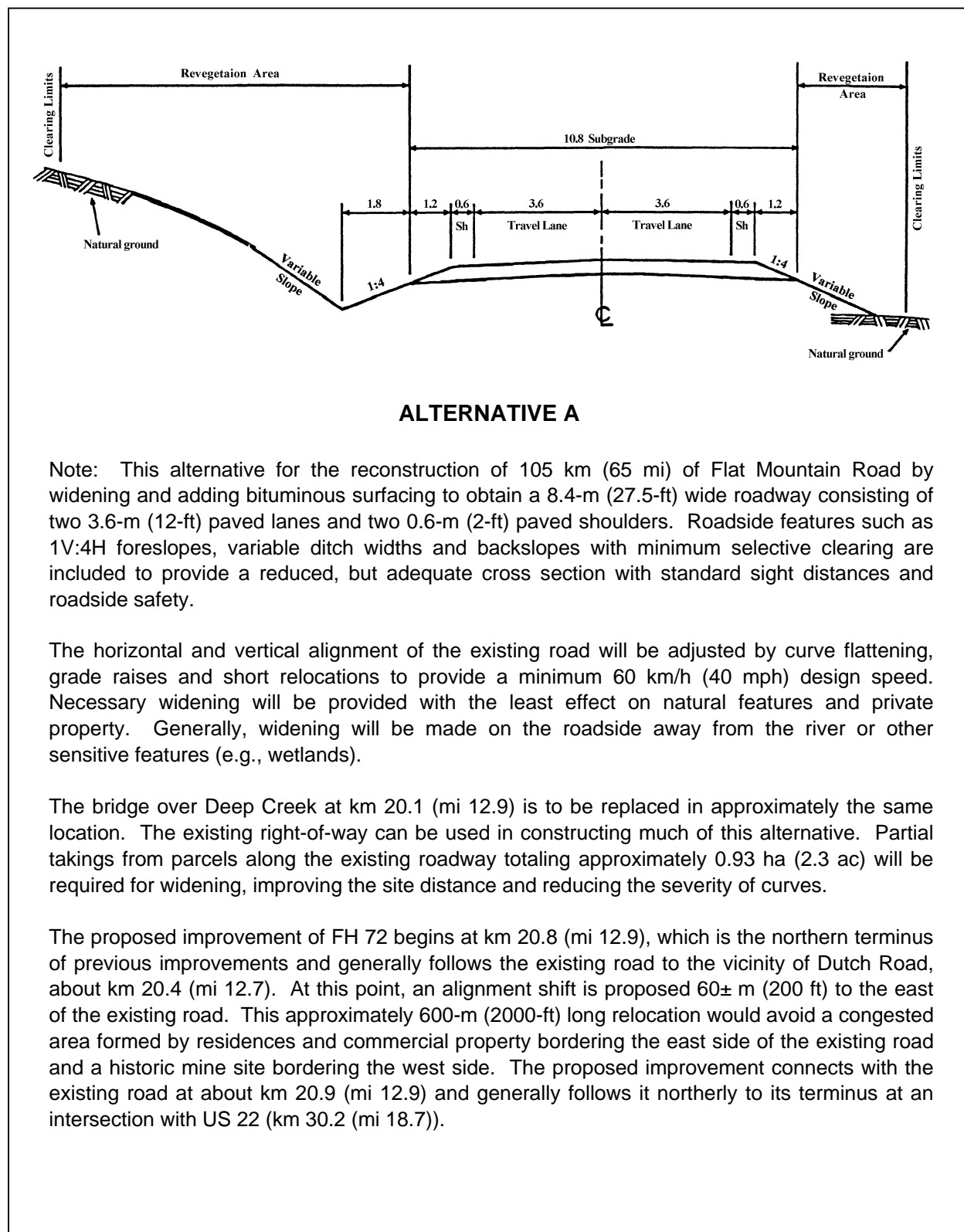
To establish the preliminary geometric design standards of roadway width and design speed, it is necessary to know the corridor's predominate terrain (i.e., level, rolling, mountainous), the functional classification of the route and the traffic volumes (i.e., current/future ADT) of the highway.

While, in many cases, the minimum AASHTO geometric standards will provide the most appropriate level of safety, convenience and operational efficiency, alternatives with different standards must also be considered to address any special factors (e.g., economic, environmental, operational) that affect the road, its users and context. Gathering and evaluating diverse land use, transportation, environmental and economic data, together with applied engineering judgment and analysis, will aid in formulating practical improvement alternatives above and/or below the minimum full standards.



The preliminary design standards used to describe the alternatives provide guidance for establishing other criteria to be used in the design process. Many of these other elements are functions of the ADT, design speed or roadway width and are set during the design activities. The preliminary design standards, as well as the other design standards and criteria, become the final adopted project standards when the design approval is issued (see [Chapter 9](#)).

[Exhibit 4.4-A](#) is an example of how to show and describe an alternative and its preliminary design standards. This information should also be supplemented with a map depicting the location of the alternative as discussed in the next [Section](#). When comparing numerous alternatives, it can also be effective to display them together in a conceptual setting.



**Exhibit 4.4-A TYPICAL PRESENTATION OF AN ALTERNATIVE**

#### 4.4.4 Highway Corridor

When formulating improvement alternatives, it occasionally becomes apparent that a highway should be considered on new alignment in a corridor outside of the existing road. In fact, there may not even be a road connecting the termini, although this situation is not common.

New highway corridors are usually identified and evaluated separately from an alternative's preliminary design standards although they must be compatible with all the components that make up the alternatives. A highway corridor can be defined as a linear strip of ground that connects termini and has sufficient width and variable positioning on the terrain to allow a road with its preliminary design standards to be built within its borders.

Depending on length and terrain, most corridors are between 30 m (100 ft) to 120 m (400 ft) wide. Its position on the topography is tied to existing land forms and sometimes defined in relation to a survey traverse line (see [Chapter 5](#)).

Highway corridors are normally established with three general objectives in mind:

1. **Size.** The corridor must be broad enough to allow the highway centerline to be positioned or shifted in conformance to the geometric standards and to achieve reasonable cost effectiveness.
2. **Features.** The geographical and geophysical features should be stable and compatible with the construction, operational and maintenance requirements of the highway.
3. **Environmental Impacts.** The environmental impacts should be minimized and aesthetics maximized.

Historically, the process of investigating new highways and corridors was called a location survey or reconnaissance study. Currently, much of the process is covered by the environmental analysis and documentation. However, the basic procedures in establishing feasible highway corridors are still valid.

A thorough initial investigation is essential in making effective corridor determinations. If the most feasible, serviceable and economical corridor is not determined at this stage, no amount of engineering effort can overcome the inherent deficiencies that will exist. When presenting corridor evaluations, it is imperative that the same basic data and methods of investigation be used for each corridor studied.

Most corridor reconnaissance work is done using photogrammetric or other topographic maps supplemented with field data. On occasion, ground reconnaissance surveys are made as a substitute for or supplement to the topographic mapping.

Before beginning the study, the reconnaissance engineer should review all available maps and photographs to determine if any additional data and mapping are needed for conducting the study.

The following information is pertinent to corridor studies:

- land use, population and density;
- geophysical and geological formations;
- potential of the area for future industrial, residential, farm or recreational development (i.e., land use changes);
- frequency, condition and type of existing roads and highways serving the area;
- existing utilities and facilities, planned and potential (e.g., transportation (other than highways) dams, power lines, gas and water lines, recreational areas); and
- photographs of controlling features.

#### **4.4.4.1 Mapping Requirements**

The type and scale of mapping required for the advance planning study are dictated by the terrain and land use intensity of the route corridor area and the level of preliminary design analysis to be conducted. The maps must be complete, current and provide full details of topography and physical features.

Mosaic reproductions or photographic prints may be used to show routes or portions of routes. The route plan should be made to the same scale as the mosaic copies. If oblique photographs are used, they should show the route in contrasting lines and should be delineated legibly. The date of photography should appear on the maps.

Mapping for areas of moderate to intensive land use should be to a scale of 1:1000 (1:1200) or 1:2000 (1:2400) with a 1-m (5-ft) or 2-m (10-ft) contour interval. In areas of limited or homogeneous land use and in mountainous or heavily timbered areas, a map scale of 1:5000 (1:4800) with a 3-m (10-ft) or 5-m (20-ft) contour intervals will suffice. If only broad reconnaissance is to be done, existing USGS quadrangle maps with their 1:24,000 scale may be adequate.

The photogrammetric mapping may be used where feasible and where its use is cost-effective. Further mapping discussions are contained in [Chapter 5](#).

Photogrammetric maps, topographic maps and aerial photographs of the area are good references and may be obtained from the following sources:

- previous surveys and reports;
- maps by Federal, State, county and municipal agencies;

- quadrangle maps by US Geological Survey (USGS), US Coast and Geodetic Survey and Civil Aeronautics Board;
- hydrographic surveys of rivers and river and harbor surveys by the US Army Corps of Engineers (USACE);
- tideland maps by the State land department;
- surveys by the Bureau of Reclamation, NPS and Bureau of Indian Affairs (BIA);
- highway right-of-way maps by FHWA, State and county agencies;
- township maps by the Bureau of Land Management (BLM);
- maps by Forest Service (e.g., transportation maps, firemen's maps, topographic maps);
- stereophotographs from private sources and government agencies, particularly the USGS and the Department of Agriculture;
- geological reports and bulletins;
- railway maps and profiles; and
- maps made by the State planning divisions (i.e., county maps showing county road systems and roadside culture and city maps, which include the immediate surrounding area).

#### **4.4.4.2 Photographs**

Ground photographs or oblique aerial photographs should be taken of controlling elements in the field to supplement the mapping. These can be used in analysis, report illustration and for exhibits in the public involvement process.

#### **4.4.4.3 Corridor Selection**

Specific procedures should be followed in the selection of route corridors for comparative evaluation. Common points of termini for all routes to be studied should be identified in addition to any constraints that may limit alignment, grade and route location.

Typical constraints include the following:

- Limitations imposed by design standards (e.g., maximum allowable grades and curvature).

- Physiographic controls (e.g., landform and watercourse gradients, shorelines, property or jurisdictional boundaries, preemption of lands for other (usually higher) use) and the avoidance of known problem areas (e.g., unstable, highly erosive land forms).
- Economic controls, including encroachment on high cost lands or improvements, and alternatives involving features of excessively high construction cost.
- Mandated points of contact (e.g., intersection with a limited access facility where the access point is predetermined, access to a major point of interest that has a fixed location).
- Environmental controls, some of which are mandated by law, govern the avoidance of wetlands, prime and unique farm lands, habitat for endangered species, historical and archaeological sites and park lands.

#### **4.4.4.4 Aesthetic Elements**

Weigh the aesthetic qualities of the corridors under investigation as carefully as those that contribute to traffic safety, highway efficiency and structural adequacy. Gentle curves, easy grades and lanes with adequate clearance between passing vehicles contribute both to pleasant and safe driving. Both horizontal and vertical alignments should be coordinated to create a total roadway alignment that complements rather than disrupts the natural landform.

Pleasing appearance can usually be achieved at little extra cost if the road is located with these aesthetic elements in mind from the start. Further, roadside development (e.g., scenic vista, angler's parking areas), erosion control, flattening and rounding slopes, seeding and revegetation contribute significantly to roadway beauty and safety as well as reduce maintenance cost.

When the merits of competing locations are nearly equal, scenic quality may be a deciding factor.

To ensure aesthetics in highway design, accomplish the following:

- Direct the highway toward worthwhile scenic features within reasonable range.
- Locate the highway so that scenic features are large (e.g., mountains, lakes) and directly ahead of the driver's line of vision.
- Make maximum use of independent horizontal and vertical alignment on divided highways to blend the roadways into the terrain and reduce harsh effects and unnecessary construction scars.
- Coordinate vertical and horizontal curvature. The best appearance is achieved when vertical and horizontal curves coincide, or horizontal curvature leads vertical curvature slightly.

- Avoid short, abrupt horizontal and vertical curves, especially if the central angle is small.
- Avoid long tangents in rolling country. Roller coaster profiles are visually distressing.
- Ensure that sufficient right-of-way area can be provided at ends of tangents and on the inside of curves to permit ample clearing and to prevent erection of buildings or structures that could impair perspective or horizontal sight distance.
- Avoid unsightly obstacles by adjusting the alignment away from the obstacle before it is within the driver's view.

#### 4.4.4.5 Map and Photograph Study

Use a large scale map that shows only the major topographic features (e.g., rivers, mountains, roads, cities, towns) to show the various alternative corridors between the termini. By studying this map, select the more representative alternatives. The most feasible alternatives to be evaluated in detail may then be chosen through a process of elimination.

Next, the locator should intensively study and analyze the collected material before going into the field. If good photographic and map coverage is available, much of the hard work of reconnaissance can be done by stereo aerial photo analysis and map study. Impractical locations can logically be eliminated, freeing the locator to concentrate on the more promising alternatives during the field investigation. Further refinement or elimination of alternatives may occur following the field investigation. The following applies:

1. **Map Study.** Study of the topography between assigned termini will reveal avenues through the terrain that may be followed for a road location and barriers that must be avoided. Ridges or watersheds are often good avenues, and where there are long regular ridges leading in the right direction, the locator is indeed fortunate. Valleys are also excellent avenues if they lead in the right direction. The most difficult locations are those that cut across the natural avenues or those that lie in confusing terrain where the ridges and streams have no continuous well-defined direction.

Each possible avenue should be examined, though some may be immediately discarded as impracticable. Each practical route should be sketched on the map using different colors or line symbols. Where the gradient might be controlling, the grade contour should be stepped out on the map with a bow divider or equivalent CADD technique to ensure that the route grade is within acceptable limits. Points where curvature may be critical should also be checked.

2. **Stereo Aerial Photo Analysis.** A reasonably good study can be made by stereo examination of aerial photos. It is possible to check gradients using only the stereoscope and an engineer's scale. Possible lines may be sketched on the photos and compared with map locations. Stereo examination will yield information that may not be shown on a map, so if both the map and photos are available, both should be used.

A thorough map or stereo aerial photo study should investigate all possible routes within a band that is 40 to 60 percent as wide as the distance between termini. If adequate photo and map coverages are not available, the locator should view the terrain from a light plane or helicopter before going into the field. Under some conditions it is desirable to have air photos of the route made for use in the reconnaissance.

The time required for the field work of reconnaissance depends on the effectiveness of the preliminary office studies, the accessibility of the route, weather, etc., and might vary from a day to weeks. The field investigation can be made by any means available (e.g., vehicle, horseback, by-foot). During this investigation, the locator observes and keeps notes on the forest cover, drainage, bridge sites, the nature and classification of the soil, rock outcrops, land use and anything else that might affect the location.

#### 4.4.4.6 Major Considerations and Physical Controls

The termini are the major controls of the route. From a strict user's standpoint, the most economical route is a straight line between the termini, both horizontal and vertical.

However, the practical economic location and the environmentally acceptable locations are based on a compromise between construction cost, user's cost and environmental impacts.

Physical controls (e.g., bridge sites, rock areas, valley and mountain sides, built-up areas, lakes and drainages) affect the construction costs.

#### 4.4.4.7 Information to be Obtained

On each corridor studied, the following information should be known:

1. **Termini.** Common study termini should be used even though some routes may use portions of existing facilities that already conform to standards.
2. **Traffic Data.** Assembly of data on traffic and projected roadway use requires a thorough research effort. Primary source agencies are Federal, State and local road administration and planning agencies. In some instances, it may be necessary to conduct special traffic studies as a part of the corridor study. Research and collect all available data on the following subjects:
  - Traffic data on existing facilities:
    - + average daily traffic,
    - + seasonal average daily traffic,
    - + peak hourly volumes, and
    - + design hourly volumes.
  - Traffic trends, past and projected.



- Classification of vehicles (percent passenger vehicles, percent trucks and buses and percent recreation vehicles).
- Crash data:
  - + route segments, and
  - + spot high-hazard locations.
- Directional split.
- Turning movements at major intersections.
- Traffic desire lines.
- Speed and delay data.
- Conflict study data.

Traffic desire lines, speed and delay data and conflict study data are optional depending on specific project requirements.

3. **Right-of-Way.** Identify the existing right-of-way corridor and roughly approximate the proposed right-of-way area. Describe the property affected and the nature of impacts. Estimate the approximate right-of-way cost and any special right-of-way problems. If all or part of the route crosses government land, identify the agency controlling the land.
4. **Geology.** Identify the geology of the general area. Use a geologic map if one is available. Interpret and show the relationship of the geology to the proposed route. Include the location and the extent of the following features:
  - landslide areas;
  - solid rock;
  - unconsolidated material;
  - ground water and surface water conditions; and
  - availability of road construction materials (e.g., type of deposits, quantity and quality).

Make recommendations for type of materials to be used (e.g., borrow, waste sites, contractor staging areas).

5. **Controlling Factors.** Describe all controlling features involved in route selection. The following provides some examples:

- railroad crossings;
  - bridges and other structures;
  - high-voltage power line crossings (i.e., record elevation of low point in cable and air temperature);
  - problems involving terrain and/or access; and
  - utilities and/or special services.
6. **Design.** Describe range of proposed preliminary roadway design standards, especially alignment and grades, roadway sections, type and cost of structures and other preliminary design elements being considered. Many of these are illustrated in a roadway cross section.
7. **Construction Materials.** Describe all construction materials available in the area. Identify pit sites by location and pit number, if known, and give names and addresses of local construction materials' suppliers.

Depending on the detail and accuracy required, a preliminary design line may have to be developed through the corridor to approximate and represent the alignment and construction cost parameters. The procedures for developing the line and grade projection/information is found in [Section 8.4](#). Cost estimates for constructing a road in the corridor are developed using quantities and unit prices for the major items. The following provides examples of major items:

- clearing and grubbing per hectare (acre);
- unclassified roadway excavation per cubic meter (cubic yard);
- minor drainage per kilometer (mile);
- surfacing and base per kilometer (mile);
- paving (type) per kilometer (mile);
- revegetation and landscaping per kilometer (mile);
- major structures per each (identify);
- right-of-way cost estimate per hectare (acre);
- miscellaneous (include construction traffic control, guardrail, guide posts, fences, etc.); and

- an estimate of the user's cost both per kilometer (mile) and from termini to termini.

#### 4.4.4.8 Corridor Study Report

Extensive corridor analyses are sometimes documented in a formal corridor study report that then can be considered a Conceptual Study Report. More frequently, though, this information is kept informal. In either case, corridor analyses are summarized in the major environmental documents (i.e., Environmental Assessment, Environmental Impact Statements). The corridor study reports not only contain the results of the corridor analyses but also summarize the preliminary design standards under consideration. In addition to the engineering information, the social, environmental and economic features of the alternatives (separate corridors) used in the analyses are presented at least in a general fashion.

The final study report should contain the following items:

1. **Introduction.** Describe the authority and purpose of the study.
2. **Organization.** Identify all sources of information, maps and data obtained for the study.
3. **Climate, Physiography and Geology.** Provide a description of the climate, significant geographic features, land uses and geology of the area.
4. **Preliminary Design Standards.** This section should include all traffic data and design criteria for the study.
5. **Corridor Descriptions.** Provide a detailed description of each corridor studied.
6. **Comparative Evaluation.** This section should contain a comparative evaluation of routes studied. Include a dissertation of the related social, economic and environmental (SEE) impacts (e.g., changes in land uses, displacement of residences, disruption of communities, environmental mitigation measures, construction costs, road user costs, secondary economic factors).
7. **Benefit Cost Analysis.** An optional section that may be used to provide a benefit cost analysis for each corridor and the basis for them.
8. **Exhibits.** Use exhibits to include route maps or aerial mosaics depicting the location of the corridors, typical roadway sections, vicinity maps, route profiles, physical characteristics outlined on reconnaissance study form and detailed cost estimates of alternatives.

## **4.5 APPROVALS**

At the conclusion of conceptual studies, a decision must be made identifying which alternative is going to be advanced into the design phase. The decision-making process is described in [Chapter 3](#).

### **4.5.1 Conceptual Engineering Studies**

Since the results of the location analysis provide the critical engineering and/or reconnaissance information, array of alternatives and, in some cases, the preferred alternative to be contained in the public environmental document; these findings should be reviewed and concurred with by the appropriate Division staff who are responsible for the clearance of environmental documents. In addition, land management agencies should also review and concur in the engineering findings regardless of whether they have been documented by informal analyses or in complete, formal Conceptual (corridor) Study Reports. This will ensure the environmental process is evaluating alternatives that the land management agency is comfortable with. Concurrence of the report or informal findings does not constitute official approval of a specific alternative or issue authority to commence design activities.

### **4.5.2 Location Approval**

Formal approval of the preferred alternative, traditionally referred to as location approval, occurs when the project's environmental clearance document is approved as described in Chapter 3, [Section 3.5](#). This also completes the conceptual study phase and advances the project into the design phase and subsequent plans, specifications and estimates (PS&E) preparation.

The description of the preferred alternative contained in the environmental decision making documents (e.g., categorical exclusion, finding of no significant impact, record of decision) should include preliminary design standards and corridor information to ensure the project will be designed to implement the approved concept.

## **4.6 REPORTING**

Conceptual studies provide findings and recommendations that are reviewed and commented on by various agencies and parties. This information can be reported to the agencies in various ways or combined in other documents.

### **4.6.1 Conceptual Engineering Study Reports**

The results of the location analysis can be contained in a separate conceptual study report (e.g., corridor study report) or more commonly be documented in a less formal manner. Memorandums, trip reports or even semi-formal checklists can be used to record the conceptual study results. In any case, this information should be documented to ensure the findings and/or recommendations, as well as existing conditions, objectives, facts, assumptions and analyses can be reviewed and understood by all interested and affected parties. All improvement alternatives should be readily supportable from an engineering position, which is contained in these study documents.

If separate formal reports are prepared, they can be in different formats or detail, and should be only as formal as appropriate for that scale of project.

### **4.6.2 Environmental Documents**

The engineering information and descriptions of the improvement alternatives contained in the environmental documents are summarized from the conceptual studies. Since the final location approval decisions are a product of the environmental process, it is imperative that environmental documents present the engineering data in an accurate, complete and understandable fashion. The content of environmental documents are described in [Chapter 3](#).

## **4.7 DIVISION PROCEDURES**

Reserved for Federal Lands Highway Division office used in supplementing policy and guidelines set forth in this Chapter with appropriate Division procedures and direction.

### **4.7.1 EFLHD Procedures**

### **4.7.2 CFLHD Procedures**

### **4.7.3 WFLHD Procedures**